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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND ond ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rotes: United States, Canado, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per yeor and $7.00 for two years. Changes of address should be submitted four weeks in odvonce of publicotion date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed orticles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

Is Projection An "Art"?

A FEW PROMOTERS who appear to be overly bedazzled by the products of foreign technology have taken up a new hobby, namely, lambasting this writer for "glamorizing" motion-picture projection into the "higher realm of fine art." IP is proud to be the target of this sometimes hotly phrased criticism.

We can all agree that there is a world of difference between the fine arts of classical culture (painting, sculpture, architecture, music, dancing, poetry, and drama) and the "art" of the artisan and the skilled craftsman. But IP maintains, and will continue to maintain, that motion-picture projection is an art in addition to being a technological trade.

What are the movies, and what is the theatre? The theatrical motion picture is primarily an attempt (and a very successful one) to provide a **credible facsimile** of human personality, human emotions, and the multifarious facets of human experience. The movies are thus infinitely more than mere pictures that move! Indeed, they might equally well be called **emotion pictures.**

Now if the **human** element be removed from the screen, what remains will be an accurate sight-and-sound recording medium for use in the science laboratory and on the missile-tracking range, but it would no longer be a medium capable of a higher function, namely, entering into and influencing in its pleasant way the life of the people. **In no other field of human endeavor has the machine been so "personalized" as in motion pictures.** Theatre movies are **made by people** and **shown by people** to be **enjoyed by people.** It can never be otherwise.

The names of projectionists do not appear in the production credits; and the millions of moviegoers who thrill to the marvelous illusions summoned into lifelike reality by our art seldom know who we are or what we look like. But no matter: we are there, behind the scenes, the "unseen showmen" of the theatre, making all the magic possible by our untiring efforts and consummate technical skill. Without a projectionist, all of the artistry, brilliance of conception, and technical care that go into a fine film would remain unseen, unheard, and unfelt in dead rolls of motionless photographs and silent soundtracks.

Just as the projector is the neck of the bottle through which all must pass, the projectionist is the key figure in a long chain of events which ultimately places all of the artistry of production into his hands to be vivified by the artistry of projection.

Is the practice of projection merely a simple "repetitive" process no more complex than crating eggs, as our critics aver? There is more to projection than threading reels of film and making changeovers! Many a projectionist has spent long, lonely hours repairing a faulty unit under trying conditions, or perfecting a critical adjustment to obtain brighter, clearer, steadier pictures and more natural sound for the benefit of the public he serves.

Not only that, but many a show has been kept running in the face of dire emergency by the quick action and technical knowledge of the projectionist; and in the days of dangerous nitrate films, his alertness has even saved lives.

The novice "operator" who lacks the requisite competence soon learns to his sorrow that projector mechanisms, arc-

(Continued on Page 14)

INTERNATIONAL PROJECTIONIST

Volume 36 January 1961 Number 1

Color Factors In Projection Illumination

By ROBERT A. MITCHELL

Projection light should be pure white as reflected to the eyes of the audience, not perceptibly yellowish, bluish, or otherwise discolored. Herewith a probe into the numerous factors affecting the color of projection illumination — light sources, screens, lenses, and mirrors.

PROJECTION ILLUMINATION which is noticeably discolored is objectionable in appearance and unsuitable for the projection of dye-image color prints. Yellowish light gives the impression of dimness and "sickliness," bluish light appears harsh, chalky, and psychologically "cold," and greenish, lavender, or pinkish light looks very unnatural and distorts color values. Only a pure white light similar in quality to direct noon sunlight is wholly satisfactory for the projection of motion pictures in black-and-white and color.

Many authorities, however, favor illumination which simulates average daylight, a mixture of direct sunlight and skylight.* This is just perceptibly bluer than direct sunlight alone, and is admittedly a very satisfactory quality of light for projection. Illuminants resembling direct noon sunlight or average daylight have the advantage of being chromatically neutral to the human eye, that is, not predominately "warm" or "cold" in a psychological sense. But the color of light emitted by the illuminant, itself, is not necessarily the same as the color of light reflected by the screen to the eyes of the audience. The screen surface, lenses, mirrors, and port glass all have more or less effect upon the color of the light.

Balanced Light Best for Color

Dye-image color films give good results only with projection illuminants which comprise a balanced mixture of all visible wavelengths of radiation, and which the average observer describes as "colorless" — sunlight-white or daylight-white.

If a projection illuminant contains a preponderance of red, orange, and yellow wavelengths relative to the amounts of green, blue, and violet present, normally balanced color prints will appear too "warm" — orangey or brownish. In this case, red and yellow objects reproduce too brilliantly on the screen, while green and blue objects are unnaturally darkened. This is why the strongly orange-yellow light of the tungsten-filament lamp is unsuitable for the projection of theatre-release color films. Even the low-intensity carbon arc, once the most widely used of all theatre-projection illuminants, emits a light too yellowish for the best color reproduction.

A definitely bluish light, on the other hand, dulls the red objects in color pictures and unnaturally brightens the greens and blues, making the picture look "cold." The flesh tones of actors are apt to appear anemic under this type of illumination; and because of the peculiar spectral characteristics of the violet and purple images in color films, a bluish projection light makes these colors decidedly too blue (turning purple to blueviolet, and violet to ultramarine-blue). On the other hand, a yellowish projection light noticeably reddens the purples.

There is a vast difference in properties between a violet object which reflects pure monochromatic violet light to the eyes and one which reflects a mixture of blue and red light. The latter is very changeable in color under different conditions of illumination, whereas the former may appear darker or brighter, but does not change in hue.

Characteristics of Sunlight

With the exception of certain gas-discharge lamps, nearly all illuminants give spectra which "peak" in a definite wavelength region. There is no such thing in nature as an "equal-energy" source which emits all wavelengths at the same intensity. The radiation of the sun, as observed from outer space far beyond the earth's atmosphere, peaks in the blue region of the spectrum, and is perceptibly more bluish than the sunlight which illuminates the earth's surface, where it resembles the somewhat yellower light of a source peaking in the green. The atmosphere scatters much of the blue and violet in the sun's rays, making the sky blue in color and direct sunlight more yellowish. The radiation of the high-intensity carbon arc also peaks in the green region of the spectrum, and in other ways more closely resembles natural direct sunlight than any other projection light source.

An equal-energy source can only be simulated by means of special filters. The light from such a source is slightly lavender-pink when compared visually with natural sunlight or the snow-white light obtained from high-intensity projector carbons. Equal-energy radiation contains relatively higher intensitives of violet and blue wave-

*"At naan an a clear summer day, the illuminatian an a harizantal surface due ta direct sunlight is approximately 8000 faatcandles, and that due ta the diffuse skylight abaut 2000 faatcandles." Quated fram the Handbaak af Calarimetry, p. 17, prepared under the direction of Arthur C. Hardy, Prafessar af Optics and Phatagraphy, Massachusetts Institute of Technalagy.

lengths at one end of the visible spectrum, and of red wavelengths.

Stated another way, a natural source of pure white light (the sun or the HI carbon arc) emits more strongly than the imaginary equal-energy source in the green and yellow spectral regions to which the human eye is most sensitive.

Xenon Lamp a "Hot" Source

Now, every known light source suitable for motion-picture projection emits invisible radiations which are just as heat-producing as the visible ones we know as "light."** These are the ultraviolet rays beyond the violet in the shortwave end of the visible spectrum, and the infrared rays beyond the red in the longwave end. Fig. 1 illustrates in the form of a spectrophotometric graph the ultraviolet, the visible, and the infrared bands of radiation emitted by two widely used projection illuminants, the HI carbon arc and the xenon gas lamp.

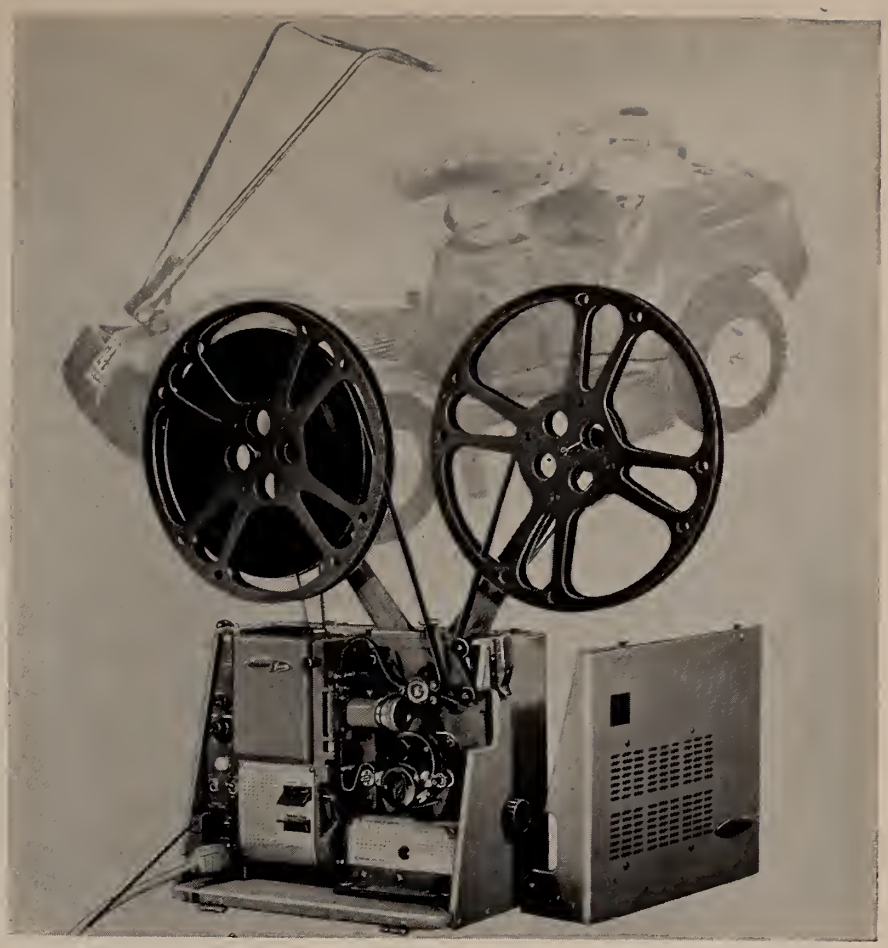
Figure 1 reveals that the infrared radiations of these two sources produce much more heat than the comparatively small amount of ultraviolet radiations present. The ultraviolet is chemically active and exerts a bleaching action upon color-film dyes; but in the case of the xenon lamp, the excessive ultraviolet radiation is removed by the use of ultraviolet-absorbing condenser lenses or by means of a dichroic "cold" mirror.

The hot infrared radiation is harmful to both film and mechanism, and, of course, is useless to projection because it contributes nothing whatever to the brightness of the picture. In regard to this, it is of interest to note that the zenon lamp, because of the broad peaks in its infrared spectrum, is many times more heat-producing, lumen for lumen, than the HI carbon arc. In fact, the xenon lamp is even hotter, lumen for lumen, than the old LI carbon arc, but not quite so hot as tungsten ("mazda") illumination.

Emission of Visible Radiations

Although the character of the ultraviolet and infrared spectra of projection light sources have a bearing upon the overall efficiency of the illuminant and indicate whether heat filters or dichroic mirrors should be used, **the brightness and color of the illumination depend solely upon the spectrum between the shortwave extreme of 400 nanometers (violet) and the longwave extreme of 750 nm (red).** As a matter of fact, the significant portion of the visible region

**The term "visible light" is tautalogical, inasmuch as the ward "light," alane, implies visibility. It is therefore undesirable ta speak af the invisible electromagnetic radiatians (X-rays, ultraviolet, infrared, and radia waves, etc.) as "black light" ar "invisible light." We have frequently pained the purists by cammitting this philalagical peccadilla.



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lies between 425 and 675 nm because of the very low visibility of shorter and longer wavelengths. This is indicated in Fig. 2, which shows the sensitivity of the average normal human eye to the visible spectrum.***

Figure 3 gives the spectrophotometric curves of the tungsten-filament lamp, the LI and HI carbon arcs, and average noon sunlight at Washington, D.C. The yellowish-orange cast of tungsten light is immediately apparent; and the curve for this illuminant dips to rather low values in the green, blue, and violet regions of the spectrum. Due to the fact that the "peak" of tungsten emission occurs beyond the visible spectrum in the infrared, this light source must also be regarded as inordinately heat-producing and inefficient. Tungsten lamps are used almost exclusively in small 16-mm and 8-mm projectors for home, school, and television use.

The curve for the HI carbon arc is remarkably similar to that for average noon sunlight, while the LI-arc curve is intermediate between the solar and tungsten curves. This means that the HI arc gives a pure white light resembling natural sunlight in all essential respects, while the LI arc inclines to yellowness because of its preponderance of red, orange, and red rays, and its deficiency in blue and violet rays.

Color Temperatures Impractical

Spectrophotometric curves of the type shown in the accompanying diagrams are much more meaningful than "color temperature" designations of whiteness. Actually, only perfect "blackbody" or "graybody" radiators emit light which can be accurately described by a thermometric scale; and of all the sources illustrated in Figs. 1 and 3, only the tungsten lamp has a color temperature in the strict sense of the word.

A tungsten lamp filament is a graybody radiator which emits light of a definite color when raised to a definitely specified temperature by the passage of electric current. A graybody differs from a perfect blackbody only in the quantity, but not in the quality, of the radiation it emits at temperatures high enough to produce incandescence.

The tungsten-filament curve shown in Fig. 3 represents the radiation of a graybody (or blackbody) at a temperature of 3250° Kelvin (5390° Fahrenheit). If the current passing through the filament is decreased, the temperature is lowered and the emitted radiation is redder. Higher color temperatures, on the other hand, are bluer.

The color temperatures of the other sources in Fig. 3 can be designated only approximately, inasmuch as their spectrophotometric curves do not coincide with those of perfect blackbody radiators. Thus the light emitted by the LI carbon arc very closely rsembles the light of a blackbody at 3800° K; that emitted by HI carbon arcs approximate color temperatures ranging from 5000° to 6500° K, depending upon the current load, while the xenon lamp (Fig. 4) gives a light suggesting a color temperature of about 7500° K even though the energy distribution of xenon radiation bears no resemblance whatever to that of a blackbody heated to 7500° K.

The average approximate color tem-

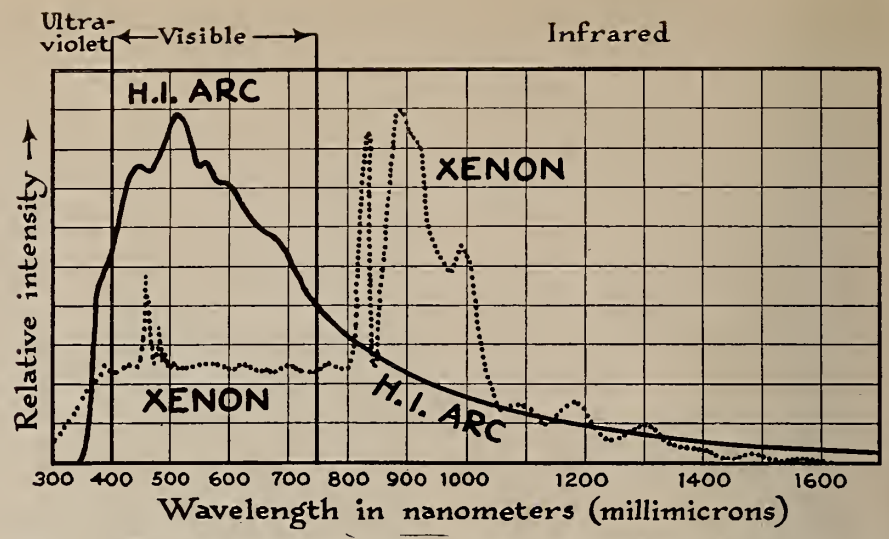


FIG. 1 — The spectrophotometric curves of the high-intensity carbon arc and the xenon gas-discharge lamp. These curves represent the spectral-energy distributions of these two light sources in the invisible ultraviolet region (300—400 nm), the region of visible radiation (400—750 nm), and in the invisible, heat-producing infrared region (800—1700 nm). The strong broad "peaks" of xenon-lamp radiation in the infrared indicate, contrary to a popular misconception, that this light source is hot for the amount of light it produces.

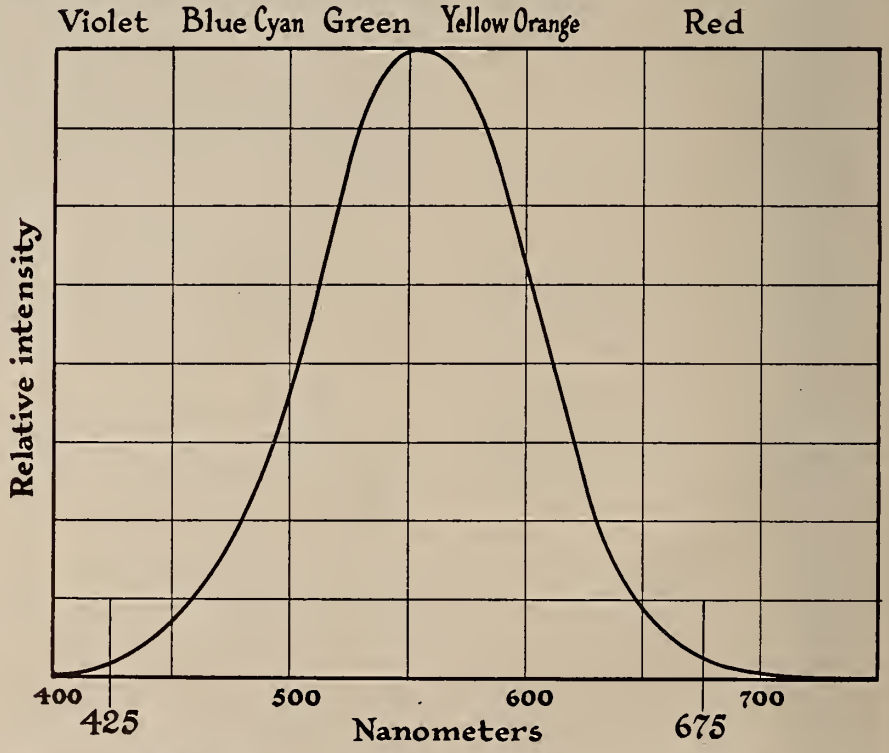


FIG. 2 — The sensitivity of the normal human eye to the visible wavelengths between 400 and 750 nm. (The significant region of visibility lies between 425 and 675 nm.) The wavelength of maximum luminosity is 557 nm in the yellow-green.

***The visibility curve in Fig. 2 has been drawn according to the determinations of Wald, Weaver, Thomson, and Ishak. The earlier Gibson-Tyndale luminosity data (upon which the 1931 2° CIE colorimetric data and modern color-TV standardization are based) are seriously in error in the violet below 450 nm, thereby failing to indicate a sufficiently great visual sensitivity to the violet. This error has been eliminated from the provisional 10° colorimetric functions discussed by the CIE in 1959.

perature of a HI projection arc burning regular HI positives close to maximum current has been found to be 5500° K, very close to that of standard noon sunlight (5090° K).

The approximate color temperature of average daylight (sunlight + diffused skylight) is in the neighborhood of 6500° K, while north skylight varies from 10,000° K to infinity, with 25,000° K a fair average. This is a white which is definitely bluish, and hence relatively weak in the red and orange end of the spectrum.

Illuminants which emit light of a pinkish, lavender, or greenish cast simply cannot be described on the basis of color temperature. The light emitted by blackbody radiators varies from orange-red, at the lowest color temperatures (800-900° K), through amber-white, yellow-white, white, bluish white, and, at an infinitely high temperature, pale lavender-blue. There is no place in the scale for tints of other colors. Perhaps the best method for designating the colors of illuminants is the determination of trichromatic color coordinates on a standard chromaticity chart.

Xenon and Mercury Spectra

Figure 4 includes the spectrophotometric curves of two modern projection illuminants superposed upon those of the noon sun and the HI carbon arc for comparison. These new light sources, extensively used in Europe, are the xenon discharge lamp and the mercury-vapor impulse lamp, the latter being employed as a pulsed-light source in shutterless projectors.

Except for its excessive heat and the peak in the blue region of the spectrum (which may slightly exaggerate the blue tones in color films), the xenon lamp is visually very satisfactory. Although less bright and optically less efficient than the rotating-positive HI carbon arc, it serves as an improved substitute for the LI arcs still used in the smaller European theatres. It is fairly economical and has the outstanding advantage of a much whiter light. Xenon light is, in fact, just perceptibly lavender-blue.

The high-pressure mercury-vapor impulse lamp gives a light which is visually blue-white, but so uneven in its spectral-energy distribution that it plays unpleasant "tricks" with the dye images on color prints.

This illuminant has very sharp and intense emission peaks in the violet (405 nm), the blue-violet (435 nm), the yellow-green (546 nm), and the fellow (580 nm). There are also strong peaks in the ultraviolet (particularly at 312 and 365 nm); but the few faint emission lines present in the infrared are not important. More than any other projection light source, the

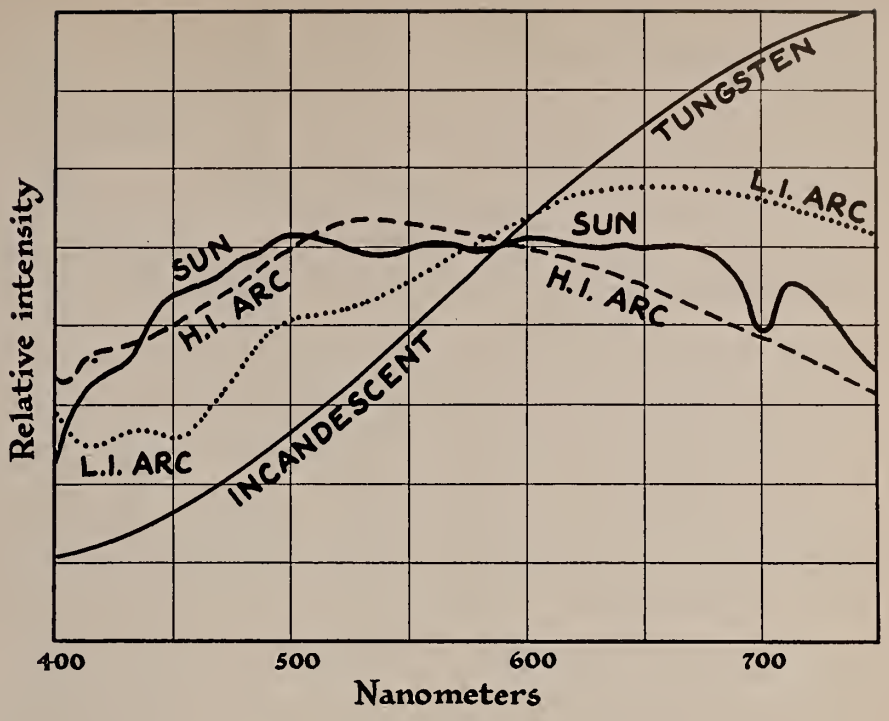


FIG. 3 — Spectrophotometric curves in the visible spectrum of average noon sunlight, the high-intensity and low-intensity carbon arcs, and the tungsten-filament lamp. Note that only the HI carbon arc accurately duplicates natural white sunlight.



mercury-vapor tube gives a "cold" light.

The paucity of red rays is a serious disadvantage of the mercury lamp. This deficiency makes even vivid reds dark and brownish, but the orange-reds and oranges reproduce brilliantly and somewhat yellower than normal. Much more objectionable is the alteration of flesh tones occasioned by the lack of red and the strong yellow emission line of the mercury lamp. The normal reddish-pink color of human skin is changed to yellowish brown or pale greenish yellow, making actors look jaundiced and unhealthy.

The insufficiency of blue rays and the strong violet and blueviolet emission lines of mercury have the bad effect of darkening azure skies and turning them purplish. Blue-greens also reproduce darkly with the mercury lamp, but the yellow-green tones which predominate in foliage look a bit too "sunny" to appear entirely natural.

There is always the possibility that the energy distribution of the mercury emittant can be improved with the introduction of small amounts of cesium and rubidium to supply blue and red lines, but experiments in this field have not yet yielded commercially significant results.

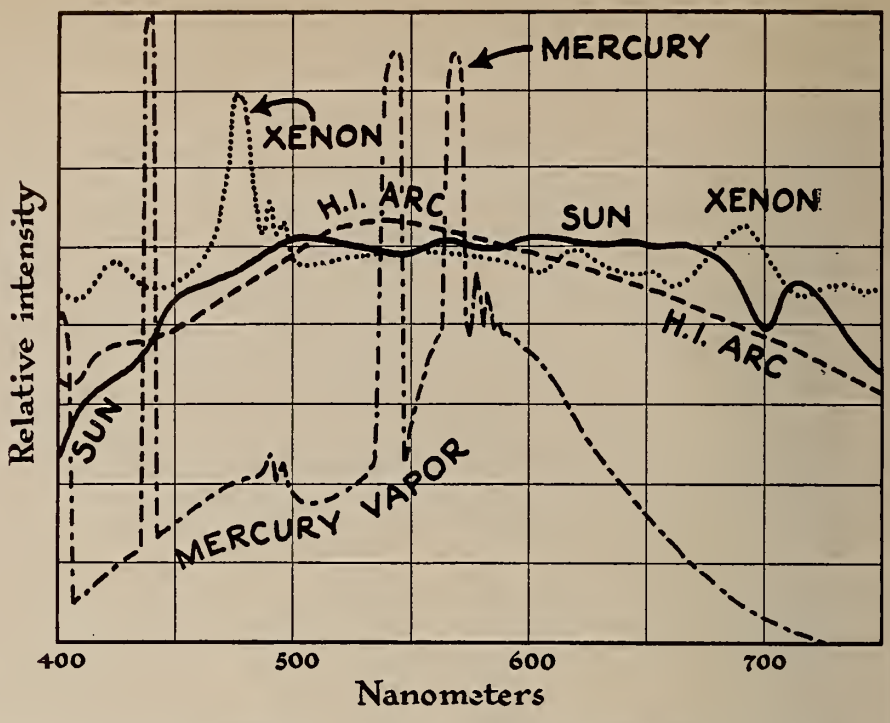


FIG. 4 — Spectrophotometric curves of the xenon gas-discharge lamp and the mercury-vapor impulse lamp compared with those of the sun and HI arc. Note the high emission of the xenon lamp in the blue and violet, and the very irregular energy distribution of the mercury-vapor lamp, which is not a satisfactory source for the projection of color films.

Color-Print "Balance"

Color prints for theatre release are "balanced" during printing to give the most accurate color rendition when projected with a light resembling noon sunlight — that is, with the HI carbon arc. Accordingly, 35-mm and 70-mm color prints appear on inspection to be slightly "warmer," or redder, than 8-mm and 16-mm color films intended for use with yellowish tungsten lamps or "Pearlex" carbons made expressly for 16-mm carbon-arc projection in large auditoriums.

The images on narrow-gauge color films overemphasize the blue colors, and therefore look "cold" and "chalky" when projected with regular HI carbons.

Except when the light is snow-white, resembling standard noon sunlight or average daylight, the chromatic balancing of color films can yield only approximate corrections. White objects in a color-film image are represented by areas of clear, undyed gelatine; and when the projection illuminant is a tungsten lamp, these areas are necessarily yellowish on the screen.

The color-balancing of dye-image prints thus serves only to preserve the proper luminosity relationship between fully saturated reds and blues, and cannot correct the whites or very pale tints in the images. Complete correction for the tungsten lamp could be obt ined by staining the entire image violet-

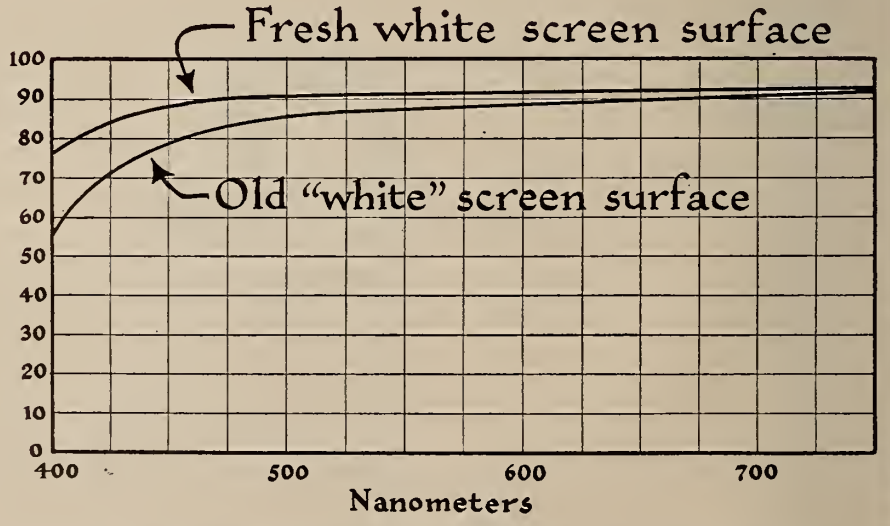


FIG. 5 — The excessive absorption of violet and blue light by old, yellowed screen surfaces as compared with the reflection characteristics of a fresh white screen.

blue, but this expedient would be extremely wasteful of light.

Advantages of Xenon Lamps

Even though the HI carbon arc is a remarkably accurate facsimile of the noon sun, many European technologists regard the xenon gas-discharge lamp as the most satisfactory illuminant of all for the projection of color films. This does not involve a consideration of such obvious disadvantages as the heat due to strong infrared emission, its lack of luminous power as compared to a modern HI arclamp, and its lower optical efficiency occasioned by relatively large source area. The xenon lamp is manifestly superior to the low-powered LI arcs which it has replaced in many European theatres; and the frequently expressed opinion that it is superior to other illuminants for the projection of color prints has good reasons behind it.

First of all, we must recognize the fact that the color of any projection light source is usually considerably al-

tered by the lamp mirror, the heat filter if any, the projection lens, the port glass, and the screen. In every case examined by the writer with a colorimeter, the projected light as reflected from the screen to the eyes of the audience is yellower, or lower in color temperature, than the light emitted from the positive crater of the HI arc. The decrease in color temperature amounts to 400—700° K, depending upon the age of the screen and the condition of the arclamp mirror.

Screen, Lens, Mirror Absorptions

Let's consider the reflection characteristics of a plain "white" screen. Even when new, matte screens surfaced with the usual white pigments (titanium dioxide, magnesium carbonate, zinc oxide, etc.) reflect less well in the extreme violet region of the spectrum than in the blue, green, yellow, orange, and red regions, as shown in Fig. 5.

The lower violet reflection is not nearly great enough to make the new screen appear yellowish; but after the surface has been exposed for several years to the dust, gases, tobacco smoke, and other impurities usually present in the air, the inevitable decrease in reflectance is much worse in the violet and blue spectral regions than in the green, yellow, orange, and red, the last-named color being affected the least. A deteriorated screen surface actually looks yellowish when compared directly with a fresh sample of the same material.

Because of its strong emission of violet and blue rays, it is claimed that the xenon lamp gives the effect of natural white sunlight even on somewhat discolored screens.

Ordinary uncoated projection lenses absorb fairly uniformly over the entire visible spectrum, although with certain types of optical glass the absorption is slightly greater in the shorter wavelengths (Fig. 6), tending to yellow the light in the same way as screen paint, although to a much smaller degree. An antireflection-coated lens, on the other hand, transmits light so efficiently in the green and yellow regions of the spectrum, that the light passing through such a lens may have a just-perceptible greenish-yellow tint under certain conditions of critical comparison. The strong blueviolet and red emission of the xenon lamp almost exactly counteracts the light-tinting effect of the lens coatings.

Port glass usually absorbs more strongly in the blue and violet, but the single thickness has a negligible effect. The color, if any, of port glass may be ascertained by examining the edge of the pane. Glass showing a greenish tinge absorbs in the red and orange as well as in the blue and violet, and should not be used. High-grade optical glass is either colorless or only very slightly yellowish.

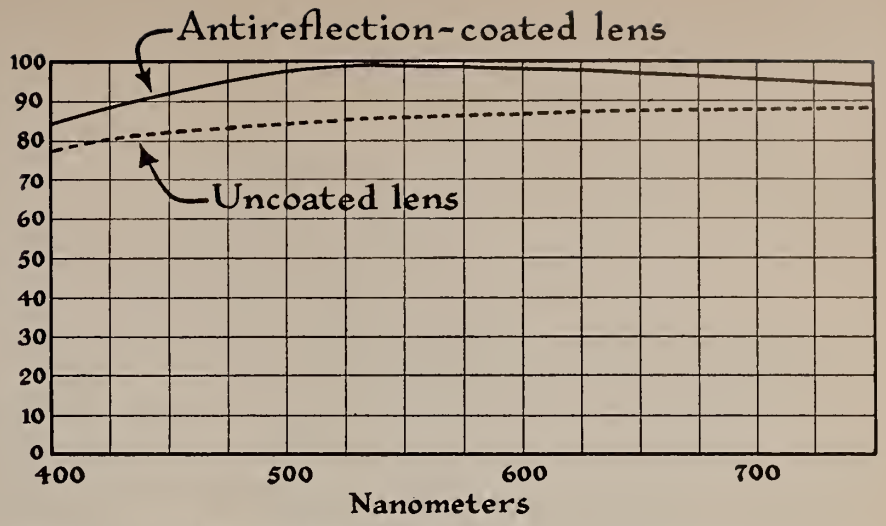
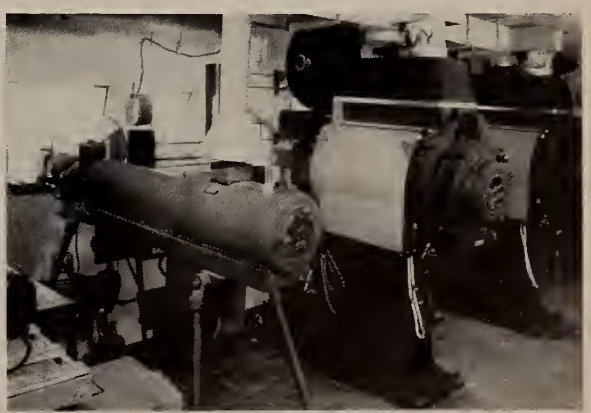


FIG. 6 — The average uncoated lens produces an imperceptibly slight yellowish coloration in white light passing through it, while an antireflection-coated lens produces a very slight yellow-green coloration. These colorations are so slight that they can be detected visually only under special conditions.

A light-coloring effect similar to that of coated lenses exists in the case of dichroic, or interfernce-type, arclamp mirrors, as indicated in Fig. 7. An ordinary silver mirror reflects light nonselectively except for a gradual falling-off in reflectance toward the shortwave end of the visible spectrum. A dichroic "cold" mirror designed to "peak" in the yellow-green region of maximum visibility has an extremely high co-

(Continued on Page 16)



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Motion Picture Film Department
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Rochester 4, N.Y.

East Coast Division
342 Madison Ave., New York 17, N.Y.

Midwest Division
130 East Randolph Drive, Chicago 1, Ill.

West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, Calif.



Everywhere in the world—because it's on film!


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ARIO LA
PIRATI



What do they do in RIO on a rainy afternoon?

ANS: They go to the movies—American movies—by the thousands.

That's one reason why technical excellence is so vital . . . why the cooperation of the Eastman Technical Service for Motion Picture Film is so highly regarded. Branches are located at strategic centers—inquiries invited.

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IP's Own List

Color Designation By Wavelength Often Useful

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WAVELENGTH OF HUE (nm)	NAME	DESCRIPTION	COMPLEMENTARY WAVELENGTH	NAME
		REDS		
c494			494	Cyan
c493	CARMINE	Rose-red	493	Cyan
c492			492	Cyan
700	RED	Deep red	492	CYAN
648			492	Cyan
635	SCARLET	Bright red	492	Cyan
626			491	Cyan
619	VERMILLION	Orange-red	491	Cyan
		ORANGES		
614			491	Cyan
609	MANDARIN	Reddish orange	490	Cyan
605			490	Cyan
602	ORANGE	Bright orange	489	Peacock
599			489	Peacock
596	PURREE	Yellowish orange	488	Peacock
		YELLOWS		
593			487	Peacock
590	SAFFRON	Orange-yellow	486	Peacock
588			485	Peacock
585	GAMBOGE	Rich yellow	483	Turquoise
582			482	Turquoise
578	YELLOW	Bright yellow	479	Cerulea
574			474	Blue
570	LEMON	Greenish yellow	460	ULTRAMARINE
566			c566	Violet
		GREENS		
561	CHARTREUSE	Yellowish green	c561	Purple
556			c566	Amaranth
551	CITRONELLE	Yellow-green	c551	Tyrian
545			c545	Tyrian
539	VERDANTE	Grass-green	c539	Magenta
532			c532	Magenta
525	GREEN	Intense green	c525	MAGENTA
519			c519	Magenta

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The campaign is spearheaded by the Hollywood AFL-CIO Film Council. For a number of years, this group has been struggling to solve a serious unemployment problem created by runaway American movie productions — pictures produced abroad, for the American market, in order to escape American wage standards. Right up to now, that trend has been growing alarmingly. By contrast, however, Bryna Productions decided to make "Spartacus" in this country. They believed the time saved through utilizing the unmatched know-how of Hollywood's craftsmen would offset the more advantageous scales prevalent in European studios.

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es, Paints, and Illuminants

514	EMERALD	"Cold" green	c514	Magenta
509			c509	Magenta
505	AQUAMARINE	Bluish green	c505	Fuchsia
501			c501	Fuchsia
		CYANS		
498	BERYL	Blue-green	c498	Fuchsia
495			c495	Cerise
492	CYAN	Green-blue	700	RED
489			605	Orange
487	PEACOCK	Greenish blue	594	Purree
		BLUES		
485			588	Saffron
483	TURQUOISE	Bright blue	584	Gamboge
481			580	Yellow
478	CERULEA	Sky-blue	577	Yellow
474			575	Yellow
470	BLUE	Deep blue	573	Lemon
465			572	Lemon
460	ULTRAMARINE	Violet-blue	570	LEMON
456			569	Lemon
451	BLUEVIOLET	Blue-violet	569	Lemon
		PURPLES		
442			568	Lemon
400	VIOLET	Intense violet	567	Lemon
c566			566	Chartreuse
c564	PURPLE	Rich purple	564	Chartreuse
c561			561	Chartreuse
c558	AMARANTH	Reddish purple	558	Chartreuse
		MAGENTAS		
c554			554	Citronelle
c549	TYRIAN	Rose-purple	549	Citronelle
c540			540	Verdante
c525	MAGENTA	Purplish rose	525	GREEN
c506			506	Aquamarine
c500	FUCHSIA	Deep rose	500	Beryl
c497			497	Beryl
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New Tape Recorder From RCA

A low-cost portable tape recorder, built to withstand prolonged use in schools, language laboratories, offices and elsewhere, has been introduced by the Radio Corporation of America.

The new recorder weighs less than twenty-five pounds and is designed for sustained operation wherever high-quality, semi-professional tape recordings are required, according to A. J. Platt, manager, RCA audio products marketing.

Designated the RCA MI-35120, the compact unit measures only 8½ by 14½ by 16 inches and is attractively styled with a charcoal gray, wear-resistant, grained fabric covering. It is designed to sell for $179.50. The recorder provides a choice of three speeds — 7½, 3¾, and 1⅞ inches per second — and operates from a 117-volt, 60-cycle power source, and will accept the 7″ reel.

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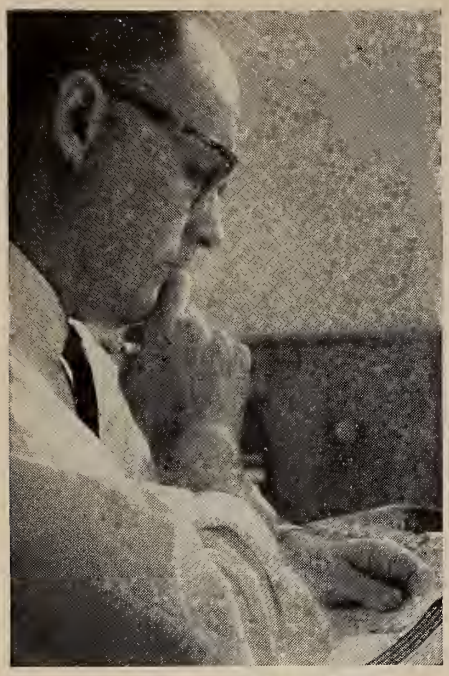
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You save more than money with U. S. Savings Bonds

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ADVERTISING COUNCIL PUBLIC SERVICE

MONTHLY CHAT

. . . Continued from Page 3

lamps, and sound equipment, no matter how well made, soon stop running if denied the care which only an experienced projectionist can provide. Yes, even the thorough inspection and satisfactory repair of prints is an "art" which can only be mastered by a long period of training!

"But that is not 'art' in the sense you projection people have implied," say our detractors. "All that is only the routine practice of a mechanical trade!"

True, the aspects of the craft mentioned above fall into the categories of mechanical, optical, electrical, and electronic equipment operation and maintenance. But this is only one side of projection.

The opening and closing of the several "acts" of a complete performance, including the use of music, and smooth, uninterrupted projection with the exercise of judgment in making the changeovers when the prints are defective is nothing less than art. In many of the smaller theatres, the projectionist is practically the "director" of the show, arranging its order, selecting short subjects, sometimes editing the newsreel, and choosing appropriate overture and intermission music. This is art. It is also true that the projectionists in some theatres even "dress" the stage in respect to the curtains, the general color scheme, and the effect lighting to provide the most pleasing setting and atmosphere for the film presentations. This, too, is art.

Now, art can be practiced only by an artist; and IP insists that the projectionist is a true artist in just about everything he does. Why? Because what he does has a single end in view, namely, the creation of an artistic effect. We also maintain that, just as the artistry of the projectionist has been generally overlooked by a moviegoing public which has been entertained by this highly specialized artistry for 65 years, modern protagonists of "automatic projection" are doing even worse: they, in effect, seek to replace the non-expendable human element in a complex and necessarily "humanized" process, believing that the substitution of unskilled for highly skilled labor will somehow benefit the movies!

"The great art of films does not consist of descriptive movement of face and body," observed actress Louise Brooks, "but in movements of thought and soul transmitted in a kind of intense isolation." The machine and the physical film are indispensable ingredients of this kind of audiovisual magic, but the machine can function only as effectively as the man who presides over it and transmits, by his own unobtrusive artistry, the "great art of films" to the screen. **iP**

New Optical System from Bausch and Lomb

NEW YORK — A completely new integrated optical system designed for the RKO Palace Theatre by Bausch & Lomb was used for the first time recently.

Major advantages of the new system include: extremely flat field sharp from corner to corner; uniform screen illumination with no washed-out center; crisp color rendition, and freedom from color fringes.

The optical system has been designed with a four-inch diameter barrel and has sufficient back focus to be used with the Simplex X-L projector.

"This system," says Charles Horstman, RKO director of projection, "delivers a tremendous improvement in screen quality over previous optical systems. It's the finest I've seen." **iP**

Hi-Speed Color Film From Kodak

A recently introduced Kodak color motion picture film that can be used in high speed cameras with exposures as short as 1/50,000 of a second was described recently by A. Earl Quinn of Eastman Kodak Company.

The color film has a tungsten light speed of 125. It can be used interchangeably with Kodak Tri-X black-and-white reversal film, which has been the accepted Kodak film for high speed photography, Quinn said.

The film's color differentiation affords additional data and information in the ultra-slow-motion movies that result from high-speed photography. High-speed photography is used in the study of rocket firings, arc welding, and other events that happen too fast for the human eye to see.

Quinn demonstrated the film's ability to record information in such low light levels that the transparency appears almost black. By making a print on Ektachrome Reversal Print Film with printer exposures up to 40 times normal, the information recorded on the original film can be salvaged in such a way that color and brightness differentiations are retained and much of the recorded data becomes usable, Quinn said.

LETTERS TO THE EDITOR

Projection Tip from "Down Under": Identification Board and Lens Box

EDITOR, IP:

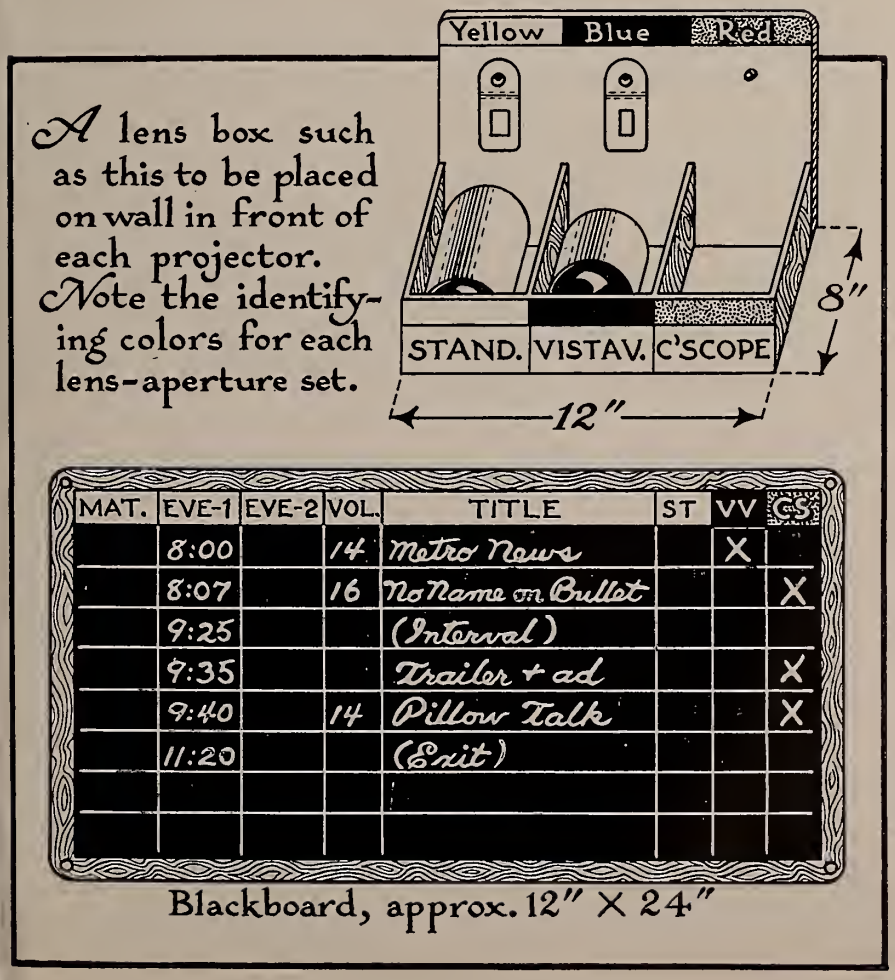
Accompanying is a diagram which illustrates the simple scheme I have used for years to identify just which feature, shorts, etc., are to be "screened in." The lens and aperture boxes are on the wall in front of each projector, and the blackboard can be in any convenient position where it can be seen from both machines.

I have placed my blackboard on the back wall above the amplifier, where it can readily be seen by the Assistant as he passes to thread each projector. The identifying colors used on both the lens-and-aperture boxes and the blackboard "headings" at the top are as follows:

YELLOW = Standard print and lens.
BLUE = Vistavision (Widescreen).
RED = CinemaScope (SuperScope).

White chalk is used for writing the program and playing times on the blackboard, and also for any special notations which may be added at the bottom. I hope that the exchange of ideas such as this "tip" proves of value to other projectionists throughout English-speaking countries.

REG. A. STEWART, Projectionist
Orana Theatre
Wangaratta, Victoria, Australia



Those Deafening Decibels!

EDITOR, IP:

Referring back to the May 1960 **Monthly Chat** ("Hi-Fi Not to Public's Taste?") I'd like to ask what is the use of high-fidelity sound when turned up to the ear-shattering level of a boiler factory in operation? "Thunderous" hi-fi loses all of its quality and beauty—and you'll have a headache when the show is over!

That's why people stay away from Todd-AO, and especially Cinerama. It's the worst—beautiful, but the worst (loudest) — of all shows.

J. H. MALOY
Austin, Texas

TO WHICH YE ED. REPLIES:

Sure 'nuff, the sound can be too loud as well as too low. There's a point in between, somewhere, that's **just right.** This critical and elusive point on the fader is properly located by listening **to the spoken dialogue.** When normal speech reproduces at the correct volume, the music and sound effects will come in as loudly or as softly as the director of the film intended.

A big orchestra playing double-forte **really** is thunderous! But don't blame your brother projectionists for those headaches — blame the musical director who planned it that way! Maybe, in some instances, the director takes full advantage of the tremendous dynamic range of modern recording to "show off" a bit. The result may be excessive loudness; but it is usually startling and effective, and audiences seem to like it.

So people stay away from Todd-AO and Cinerama? Not over here in Boston and New York, they don't! They love these spectacular shows — the big, sharp pictures and the powerful, wide-range stereophonic sound.

A mistake often made in theatres having only obsolete 35-mm sound systems is an attempt to simulate the effect of the newer reproduction processes by turning up the volume much too high. In this case more or less distortion is present, the effect intended by the sound recordist is nullified, and the nerves and eardrums of the audience are shattered. This can be prevented by the rule stated above, namely, adjust the fader for normal volume on normal dialogue, and let the music and sound effects take care of themselves.





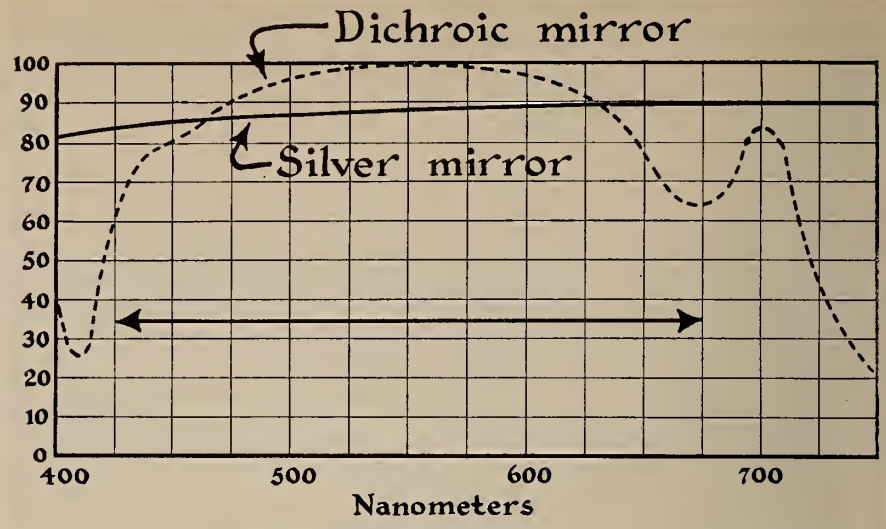


FIG. 7 — The reflection characteristics of a dichroic "cold" mirror are more selective than those of a silver mirror. A cold mirror is a much better reflector of those wavelengths of light to which the eye is most sensitive.

Color Factors

. . . Continued from Page 9

efficient of reflection over all parts of the visible spectrum except the extreme violet and red ends. (This is why such a mirror transmits a magenta-pink light—red plus violet.)

Because the reflection curve of the dichroic mirror represented in Fig. 7 emphasizes the green region of the spectrum, producing a slight coloration which can just barely be detected visually under conditions of direct comparison, the strong blueviolet and red emission of the xenon lamp tends to maintain a natural-sunlight quality of the light when used with a dichroic mirror, as it should be to eliminate heat.

It can thus be appreciated that the unusual spectral characteristics of zenon illumination (Fig. 4), rather unsatisfactory in the "raw" state, are modified by the aggregate selective absorptions of the screen, lenses, and dichroic mirror to resemble natural sunlight or HI-arc radiation. This does not mean that the light of the HI carbon arc is unduly yellowed by these factors, for such yellowing of the light cannot be considered objectionable unless the color of the light appears distinctly yellower than direct noon sunlight (5090° K).

The small selective absorptions of the violet and blue wavelengths by the lamp mirror and lenses cannot be altered by the projectionist, but yellowing of the light caused by old or deteriorated screen surfaces can be corrected by the simple expedient of installing a new screen which is truly white, or colorless. The use of pale lavender glass in the projection ports is a satisfactory expedient only in very small theatres having more than enough projection light. **iP**

New PSA Lecture On Slide Improvement

"Transparency Overlays" is the title of the newest lecture released by the Recorded Lectures Program of the Photographic Society of America.

Produced and narrated by Dr. Louise Agnew, the program shows how slides can be improved by sandwich-binding them with materials ranging from other slides and color tissues, to pieces of lace or nylon stocking. Slides which might otherwise be destined for the waste-basket can be converted into pictures with real impact by the judicious use of overlays to change or create mood, color balance, or emphasis.

Dr. Agnew, a resident of Chicago, is an associate of PSA, a fellow of the Royal Photographic Society of Great Britain, and a highly qualified artist who has perfected many of the techniques she demonstrates in this 40-minute, 73-slide presentation. **iP**

NEW MAGNASYNC DEALERS

Magnasync Corp., North Hollywood, Calif., has appointed three new foreign dealers, according to an anouncement by D. J. White, president. The dealers are William Over & Co., Pvt. Ltd., Salisbury, South Rhodesia, Photo Agencies Pty. Ltd., Johannesburg, South Africa, and Kerridge Odean Industries, Auckland, New Zealand. At the same time, all previously established representation in Cuba was completely severed. This brings Magnasync's world-wide representation to a total of twenty-two firms. Magnasync is engaged in the design and manufacture of magnetic recording systems for the professional and amateur motion picture fields.

Ampex Names McNaughten, Good, Salzman to Top Posts

REDWOOD CITY, Calif.—Neal K. McNaughten, widely-known broadcasting industry leader, has been appointed staff vice president of Ampex Corp., and marketing activities consultant for three divisions of the firm. In his new position, McNaughten will serve Ampex Professional Products Co., Ampex Audio Co., and Ampex International, according to Phillip L. Gundy, Ampex senior vice president in charge of operations for the three divisions.

Succeeding McNaughten as manager of Ampex Professional Products Co., is Leonard E. Good, formerly corporate staff director of operations services for Ampex Corp.

The appointment of Harold S. Salzman as marketing manager of Ampex Professional Products Co., also was announced. Salzman moves to Ampex from American Telephone and Telegraph Co.

Before joining Ampex (1957), McNaughten had been associated with the broadcasting industry for a quarter of a century, beginning his career at KRGV (Weslaco, Texas) in 1932. He subsequently served as manager of standard allocation for the Federal Communications Commission (1941-48), director of engineering for the National Association of Broadcasters (1948-53) and manager of market planning for commercial electronics products at RCA.

While with the NAB, McNaughten was chairman of the committee which established the U.S. broadcasting standards for magnetic tape recording.

Good, who joined Ampex in January, 1959, has been a plant manager of General Electric Co., manager of overseas operations of the United States Time Corp., and a member of the general manager's staff at International Business Machines Corp.

Salzman worked closely with broadcasting and other major industrial accounts. As marketing manager of Ampex Professional Products Co., he will direct all marketing activities associated with distribution of professional audio and video tape recording equipment.

Nearly 700 Videotape (TM) television recorders from Ampex are now in use by broadcasters throughout the world.

Kodak Has Pamphlet on Teaching of Movie Production

The great potential of 8mm sound in the teaching of motion-picture production is revealed in a new pamphlet now available without charge from Eastman Kodak Co.

"8mm In Teaching Motion-Picture Production — A New Look", a four-page pamphlet, expresses this potential in terms of a movie camera for each student in the course, of more film at less cost, and more effective teaching.

The economy of 8mm is the key. The pamphlet points out that, for the cost of one good semi-professional 16mm camera (about $1,500), as many as 62 8mm cameras (such as the Brownie 8 Movie Camera, f/2.7) can be purchased.

Similarly, a 10-minute film at 16 frames per second on 8mm costs only about one-fourth of a similar production on 16mm, and requires less than one-third the amount of film. (The new Kodak Sound 8 Projector provides for sound track addition at either 16 or 24 frames per second.) Also, 8mm adds the benefit of full color to student production, the company claims.

More effective teaching is achieved through the simplicity of 8mm equipment operation. The instructor is free to emphasize motion-picture production techniques because the student can learn to handle an 8mm camera quickly and easily. The ability to provide each student with a camera increases his ability to learn. He is not limited to working in a camera "crew," nor to script-writing, or shooting, or editing. He becomes the writer, producer, and director, fully responsible for his production from beginning to end.

The basic techniques of motion-picture production are much the same, the pamphlet stresses, whether 8, 16, 35, or 70mm film and equipment is used. Student mastery of the techniques can be acquired more quickly and at lower cost with 8mm equipment.

"8mm In Teaching Motion-Picture Production — A New Look!", Kodak Pamphlet No. T-11, may be obtained upon request to the Sales Service Division, Eastman Kodak Co., Rochester 4, N. Y.

Du Pont Considers Color Film Market

Du Pont Co., reports that it is "at least a year away from making a decision" on possible entry into the color photography film market.

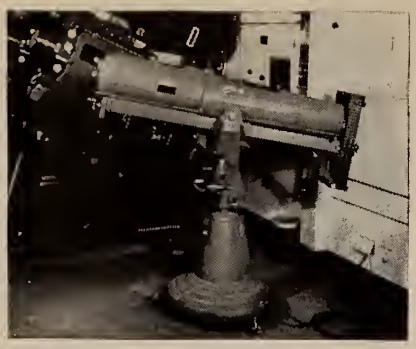
Du Pont also denied it has signed an agreement with Technicolor Corp., which, it had been rumored, had agreed to distribute and process film to be made by Du Pont.





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STRONG SPOTLIGHT — An addition to the increasingly long list of picture theatres which are installing arc spotlights is the United States Artists Theatre, Chicago, where a Strong Trouper Spotlight has been installed.

Genarco Brochure On Giant Image Projection

JAMAICA, N.Y.—Genarco, Inc., has issued a new eight-page pamphlet describing the method of projecting giant images outdoors on white walls, billboards or translucent screens with the new Genarco 3,000 Watt Slide Projectors. The brochure also shows how images 6-ft. or 7-ft. wide can now be shown by rear projection in such brightly lit areas as stores and railroad stations.

The illustrated brochure describes the new Genarco projector and gives tables for size and shape of images when projected on vertical or tilted screens. It also gives facts on what situation is best for either front or rear projection. **iP**

25/30 Club, IATSE Holds Annual Banquet

NEW YORK—The Annual Installation Banquet of the 25/30 Club, IATSE, was held at the Hotel Empire, Broadway at 65th St., New York City.

Host at the meeting was Brother Harry Aspel. **iP**

AMPEX ELECTIONS

REDWOOD CITY, Cal., — Charles P. Ginsburg, who led the development of the VIDEOTAPE television recorder, has been elected vice president of Ampex Corporation and manager of advanced video development, it was announced by George I. Long Jr., president of the magnetic tape recorder manufacturing firm.

Robert Sackman has been elected executive vice president and chief operating officer of Ampex Corporation. Simultaneously, Phillip L. Gundy and Thomas L. Taggart were named Senior Vice Presidents.

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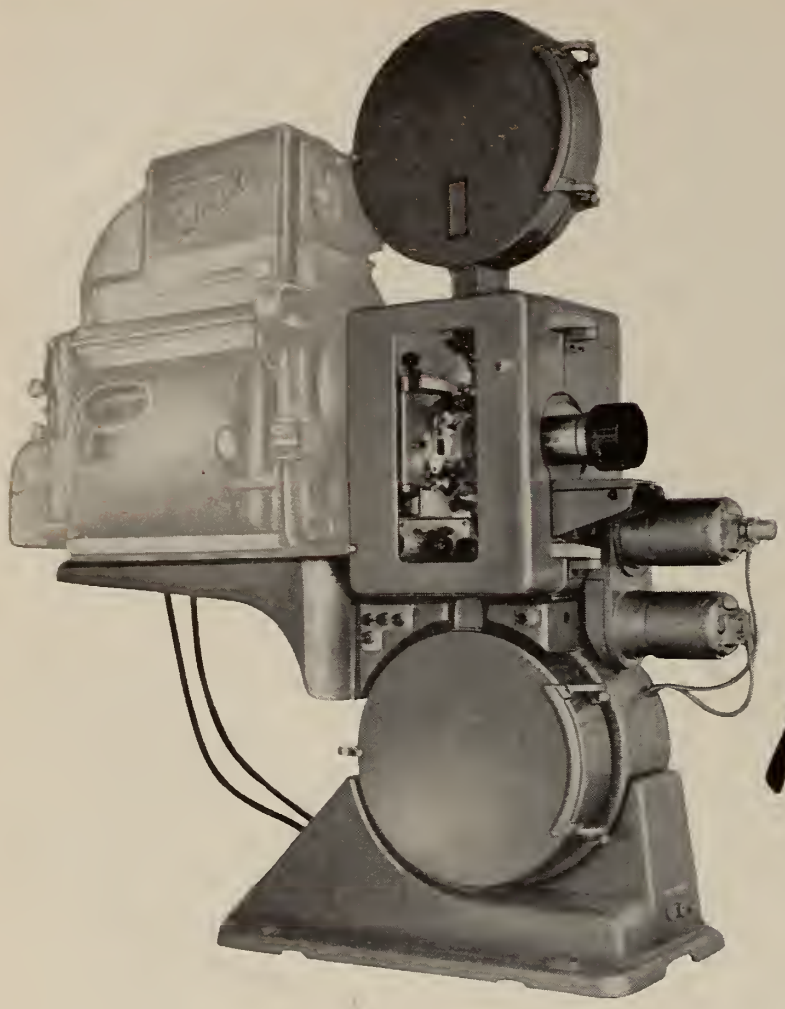
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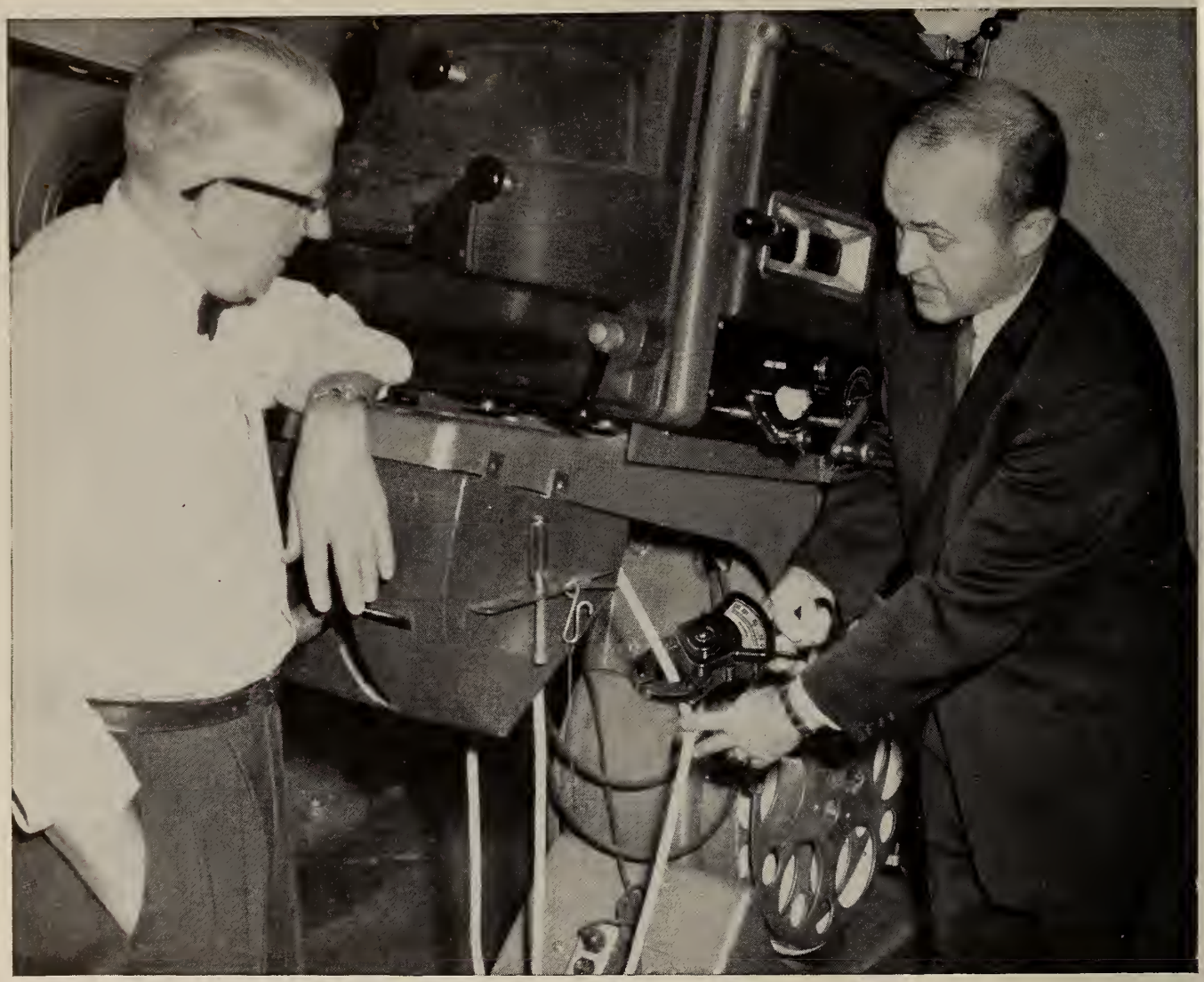
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INTERNATIONAL PROJECTIONIST, published monthly by the Internotionol Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneopolis 24, Minnesoto. Editoriol offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representotives: AUSTRALIA—McGills, 183 Elizobeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Ploce, Wellington; ENGLAND and ELSEWHERE—Wm. Dowson & Sons, Ltd., Mocklin St., London, W. C. 2. Subscription Rotes: United States, Canoda, and U.S. Possessions, $3.00 per yeor (12 issues) ond $5.00 for two yeors (24 issues). Foreign countries: $4.00 per yeor ond $7.00 for two yeors. Chonges of oddress should be submitted four weeks in advance of publicotion dote to insure receipt of current issue. Second-closs postoge poid at Minneopolis, Minn. INTERNATIONAL PROJECTIONIST ossumes no responsibility for personol opinions oppeoring in signed orticles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

Why Dim Screen Light With Good Arc Lamps? Check Your Carbon Trim and Current!

IT IS A STRANGE and unfortunate fact that dim, discolored screen light seems to gravitate into the heart of metropolitan threatre districts. Projectionist pride in good equipment is high in the downtown areas, and the most modern arc lamps, projectors, and lenses are in use. Are urban screens inferior and dirty? Investigation disproves this theory. Why, then, the disconcerting prevalence of low light levels in many metropolitan houses, **both** large and small?

A visit to suburbia provides a clue to the mystery. Smaller carbons are burned in most of the out-of-town theatres in relation to arc current and screen area, and the light is generally brighter **and distinctly whiter.** The conclusion is ineluctable: the better suburban theatres, well-managed and prosperous, employ higher **current densities** (not necessarily higher currents) in their arc lamps.

Current density is measured in amperes per square millimeter of the cross-sectional area of the positive carbon. The cross-sectional areas of the standard sizes of positive carbons are:

DIAMETER IN MILLIMETERS	AREA IN SQUARE MM.
7	38½
8	50¼
9	63½
10	78½
11	95
13.6	145¼

While the maximum current permissible with Suprex carbons is limited by the thickness of the copper coating (remember those "Victory" carbons?), tests with the various brands reveal that maximum current should never exceed a current density of 1.4 amps. per sq. mm. in the case of a Suprex positive. **More important, the minimum current density for white light and steady burning with Suprex positives should never fall below 1 amp/mm².** The specified current ranges for normally coated Suprex positives, therefore, are as follows (rounded off to the nearest 5 amps.):

SIZE OF POSITIVE	MINIMUM AMPS.	MAXIMUM AMPS.
7-mm Suprex	40	55
8-mm Suprex	50	70
9-mm Suprex	65	90

The maximum current density permissible for regular black 9-, 10-, and 11-mm carbons for rotating-positive mirror lamps is limited by the tendency to spindle, while the minimum current density is again determined by the necessity of holding a steady arc without excessive yellowing of the light. The maximum and minimum densities for all these positives are 1.4 and 1.1 amps/mm². The 13.6-mm regular carbon, however, gives evidence of somewhat different burning properties. For this size of positive, the maximum and minimum appear to be 1.1 and 0.83 amp/mm².

(Continued on Page 18)

INTERNATIONAL PROJECTIONIST

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"Low-Powered" Projection Ruled Out By "High-Powered" American Standards

By ROBERT A. MITCHELL

New European developments in projection technology have rightly evoked the admiration of projectionists everywhere. "Why aren't xenon lamps and shutterless projectors used in the United States?" The unvarnished reasons, explained in this article, are fundamentally the same reasons why tungsten-filament bulbs and low-intensity arcs are no longer suitable for theatre projection on this side of the Atlantic.

FROM THE TECHNOLOGICAL point of view, two European projection-lighting developments of the last decade are of outstanding interest. These are the xenon short-arc bulb and the "pulsed" mercury-vapor tube, the latter permitting simplified, more compact projector design, cooler operation, the complete elimination of shutter-flicker, and the elimination of the shutter, itself. The revolving shutter of the conventional projector wastes a large proportion of the light output of illuminants which burn in a continuous manner.

The xenon lamp, developed in Germany, has a high color temperature, a smooth spectrum in the visible region, and has the advantage of clean, reasonably trouble-free operation throughout its long useful life (800-1200 hours). There is no mirror pitting with xenon lamps, though theoretically the possibility of dangerous explosion exists. The xenon lamp emits no gases or dust, and hence requires no exhaust ventilation.

Because the quartz-glass bulb of the xenon gas-discharge lamp is gradually blackened by tungsten vaporized from the intensely heated electrodes, the luminous efficiency of the lamp decreases 25-40 per cent during its useful life. These lamps accordingly have to be replaced in pairs of equal light output from the two projectors. Special high-voltage ignition devices are necessary for the operation of xenon lamps, and only low-ripple rectifiers are suitable.

Xenon lamps emit strongly in the near-infrared, and hence must be regarded as "hot' light sources — much more heat-producing, lumen for lumen, than the high-intensity carbon arc. This drawback is met by the use of heat filters or "cold" mirrors. Xenon lamps are less expensive to operate (for equal light outputs) than tungsten-filament bulbs, but are not necessarily more economical than high-intensity carbon arcs.

Xenon Lamp Optically Inferior

The size and diffuse character of the glowing xenon gas discharge precludes the high optical efficiency which has always made the carbon arc attractive to projection engineers; and the fan-like shape of the xenon light source precludes optimum screen-illumination uniformity except when a special optical system, such as the "honeycomb" relay-condenser, is used. The interposition of the two raster plates of the honeycomb condenser in the light beam wastes considerable light by surface reflections and adhering dust particles.

The prime disadvantage of the xenon lamp from the American point of view (explained in detail anon) is its low luminous output. This, measured with a projector employing a standard aperture, revolving shutter of 50 per cent transmission, and f/1.7 coated Gauss-type projection lens, is only 2400 lumens for the 1000-watt xenon bulb and 4000 lumens for the 1800-watt bulb, each in optimum optical adjustment and fitted with a spherical auxiliary reflector.

Soviet illumination engineers are presently engaged in research aimed at increasing the luminous output of the xenon short arc to make this type of illuminant suitable for theatres of at least moderate size, but in view of the inevitable troublesome sublimation of the tungsten electrodes, we fail to see how this can be accomplished without increasing the area of the light source and thereby decreasing its optical efficiency still more.

Pulsed Lamp More Promising

The "pulsed" high-pressure mercury lamp developed in Holland appears to hold greater promise than the xenon lamp in spite of the somewhat unsatisfactory spectral-energy distribution of its radiation. This modern light source gives a blue-white light of a slightly greenish tinge, but actually lacks the blue and deep red wavelengths which would make it less color-distorting when used for the projection of dye-image color films.

Aside from the spectral characteristics of its radiation, the pulsed source is extremely efficient from the optical point of view and eliminates shutter losses completely. The small size of the



FIG. 1 — An installation of Philips FP 20-S shutterless pulsed-light projectors in a British theatre. Note the 6000-ft. film magazines which facilitate completely automatic projection.

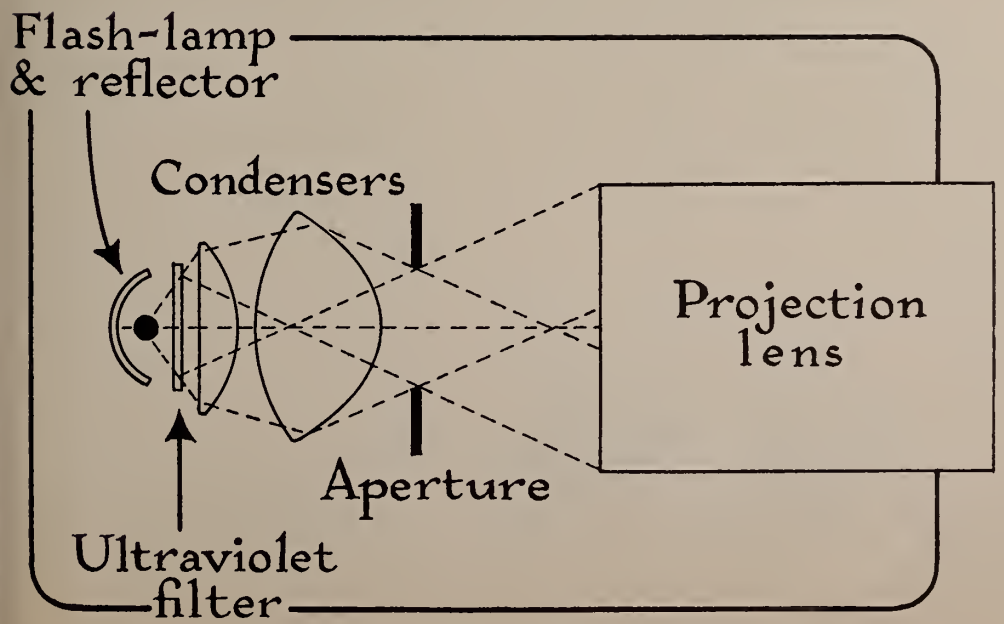


FIG. 2 — The compact optical system of a pulsed-light projector employing a tiny needle-like tube containing mercury vapor. The tube is surrounded by cool running water while in operation.

needle-like light source enables it to be placed very close to the film aperture. As a matter of fact, the entire optical assembly consisting of lamp, cylindrical mirror, condensing lenses, and ultraviolet filter is so compact that two complete assemblies are placed together, the non-operating one ready to drop into place automatically when the first short-lived tube burns out.

The pulsed mercury lamp emits only a few weak lines in the infrared, and thus more closely approaches the ideal of a "cold" illuminant than any other light source. Even so, the tiny quartz tube is surrounded by cool running water to prevent melting and bursting under the operating pressure of about 1500 pounds per square inch. A complicated vacuum-tube "pulsator" apparatus having a thyratron tube synchronized to the intermittent flywheel of the projector is a necessary part of the pulsed-light system.

Pulsed Light Flickerless

The elimination of the revolving shutter is, as we said, a prime advantage of the pulsed mercury lamp. Moreover, the use of three 2½-millisecond "flashes" per frame results in a screen-light frequency so high that the human eye can detect no flicker even in the brightest highlights of the picture, or when the projector is run without film. This is the same frequency as that produced by a 3-blade shutter, viz. 72 per second at normal soundfilm speed.

Perfectly flickerless projection has long been the dream of motion-picture technicians; and even though American audiences briefly enjoyed the absence of shutter-flicker in a few early Todd-AO productions, the propensity of film producers to pinch pennies in the wrong places has reduced the frame-rate of 70-mm productions from 30 to 24 per second, and hence the screen-light frequency from a flickerless 60 to a flickering 48 per second.

The pulsed-light shutterless projector employs a standard 3-to-1 geneva intermittent movement. This is made possible by the short duration of the light pulses (2½ milliseconds or 1/400 of a second). Although this allows an extremely small latitude of safety when 3 pulses per frame are employed (only 93/100,000 sec. on the leading edge of the first pulse and on the trailing edge of the third), there is no danger of travel ghost only so long as the pulsator functions properly and does not broaden the duration of the pulses by more than 93/200,000 sec. (less than ½ millisecond).

Luminous Output

The luminous output of the pulsed-light projector was rated as high as 6000 lumens with CinemaScope aperture, Petzval-type coated f/1.6 lens, and anamorphic attachment. A more usual estimate is 5000 lumens under these conditions at the maximum load of 800 watts.

We know that a CinemaScope aperture passes 1.21 times more light than a standard non-anamorphic aperture because it has 1.21 the area, but we also know that a CinemaScope anamorphic attachment wastes most, and sometimes all, of this extra light. In addition to this consideration, Petzval lenses are no longer approved or used in American theatres except in cases where extremely long focal lengths are required for long, narrow auditoriums. Modern Gaussian lenses are necessary for a wide field of shap focus in modern widescreen projection; and this type of lens contains one or two elements more than the simple Petzval lens widely used a decade or more ago.

Our estimate of 4500 lumens for the average total light output of the pulsed-light projector at maximum current load and employing a Gaussian lens or f/1.7 speed is therefore most generous and realistic, and places this novel machine 500 lumens ahead of a conventional projector employing the most powerful xenon short-arc lamp available for motion-picture projection.

The details of the relative merits, advantages, and disadvantages of these "futuristic" European projection systems nevertheles do not constitute the burden of this article. What we wish to make clear are the more demanding requirements of theatre projection in the United States — **requirements which can be met ONLY by the use of high-powered American high-intensity car-**

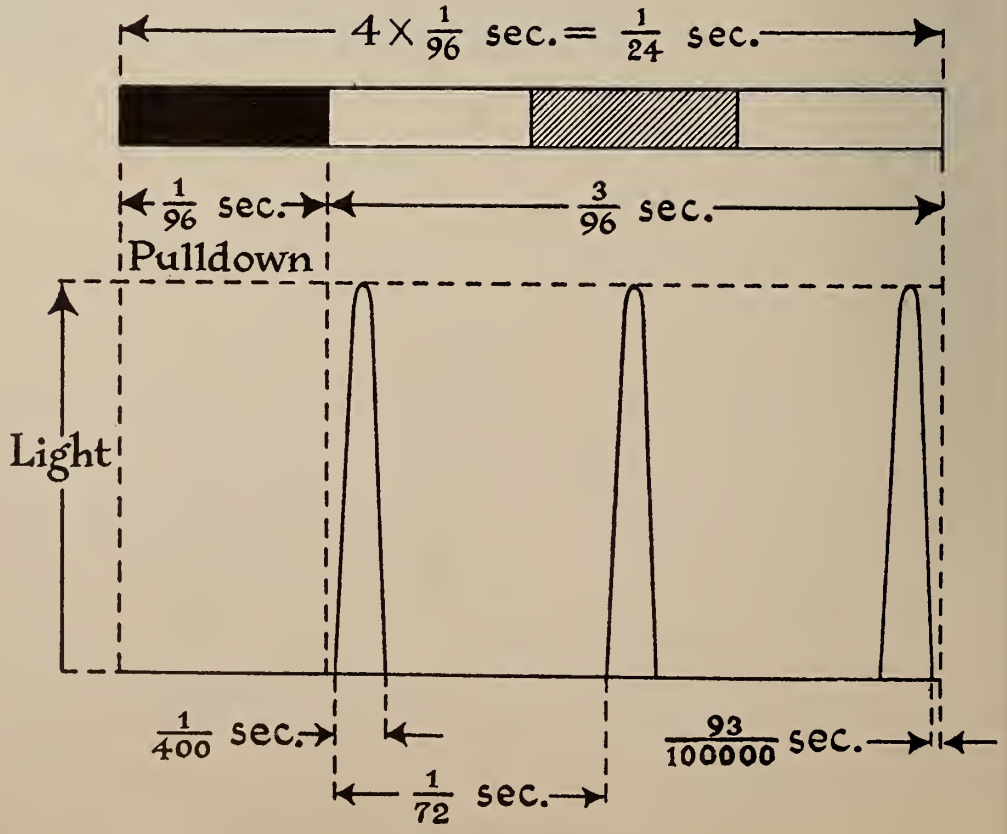


FIG. 3 — The time sequence of a pulsed-light source in a projector having a standard 3-to-1 geneva intermittent movement. The lamp is timed to emit 3 brief flashes per frame, giving 72 flashes per second, a frequency so high as to be completely flickerless.

bon-arc lamps aided, in the case of some drive-ins and other large theatres, by the use of American 5-to-1 high-speed intermittent move- which increase shutter li- sion from the stand- 65 per cent.

Average Screen Widths

A recent survey by the Motion Picture Research Council indicates that the average width of American indoor-theatre screens is 35 feet, and that the average width of American drive-in screens is 90 feet, or a little more. As a matter of fact, 6 per cent of all the drive-ins surveyed have screens ranging from 115 to 120 feet in width, while fully 4 per cent have screens wider than 120 feet. How do the sizes of European screens compare with these?

"The average theatre on the European continent," we are told, "is far smaller than the average theatre in the United States. In Holland, for example, the average is less than 700 seats, in Germany less than 600, and in Switzerland about 350 seats." These theatres seldom have screens wider than 25 feet, and probably average 13 feet for regular projection and 18 feet for CinemaScope.

Taking 15 feet as the mean width of European screens, and assuming merely for the sake of illustration the use of the same type of screen surface and the same level of illumination, the average American indoor screen requires 5.44 times more light, and the average American drive-in screen 36 times more light, than the average European screen. But to come closer to the realities of the situation, the average brightness prevailing on American indoor screens is more than twice the European, stepping up the American indoor requirement to **more than** 10.88 times the light required by the average European theatre.

American Screens Are Brighter

Integration of Research Council survey data reveals that the brightnes of the average American indoor-theatre screen (projector running, without film) is 20.41 footlamberts for non-anamorphic widescreen projection and 21.47 fL for CinemaScope. The brightnes ratio between the two processes is only 1.05, which indicates that aspect ratios less than 1:1.85 are used for standard-print projection in some theatres, less than 1:2.35 for CinemaScope in others, and that the average side-to-center screen-light distribution of 60 per cent tends to minimize the differences in light transmission of apertures of different sizes.

All the evidence indicates that the

(Continued on Page 16)

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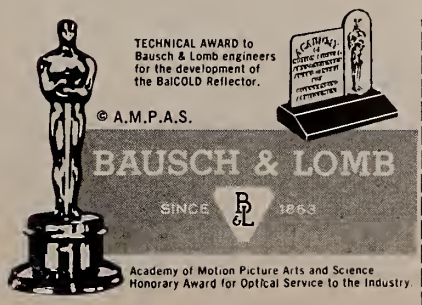
NO END-OF-REEL CONTRACTION. Lens and projector parts can't cool off and contract (thus changing focus) because BalCOLD Reflectors don't let them get hot enough to expand!

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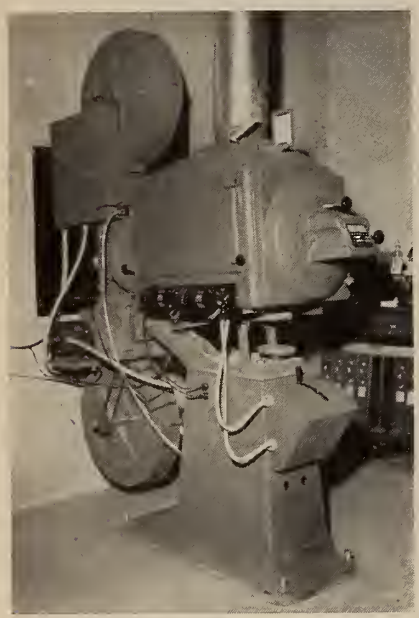
Theatre .....

Address .....

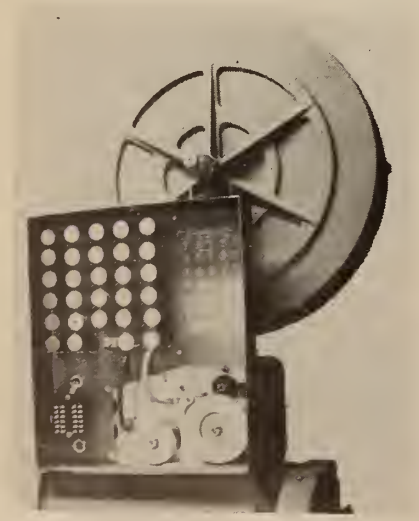
City ..... *Zone* ..... *State* .....



AUDITORIUM — 950 seats face the screen.



TRANSISTOR CABINET — Century 70/35mm projector (rear) showing transistorized amplifiers, changeovers and equalizers in cabinet.



SOUND SET-UP — Century transistorized 6 channel magnetic, 4 channel magnetic and 1 channel optical amplifiers in cabinet mounted on the projector.

In Baltimore:

Hillendale The[illegible]e Is First With Multi[illegible] Transistor So[illegible]

The Hillendale Theatre in Baltimore, Md. is one of the most modern motion picture theatres opened in recent years.

This theatre of 960 seats has comfortable seating, adequate air conditioning, a screen size giving wide viewing angles and the most modern American-made century 70mm-35mm projectors equipped with multiple channel transistorized amplification and electronic sound changeovers. The installation was made by the J. F. Dusman Company, Baltimore, Md.

The photograph shows the interior of this modern theatre having five Altec Lansing theatre speakers back of the screen and 12 surround speakers permanently installed in ceiling coves. This unique placement of the surround speakers give smooth powerful reproduction of effect sound adequately reinforcing the stereo reproduction from the stage speakers.

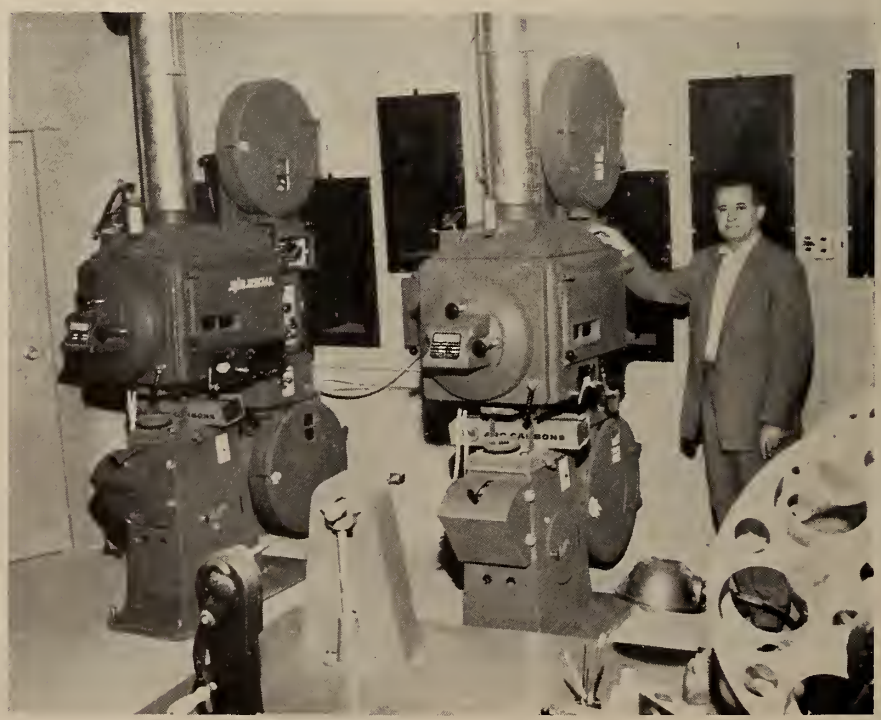
Photographs of the booth show the Century 70-35mm Model JJ projectors with strong 35/70 Projectors Lamps equipped with the transistorized multiple channel amplification. The close-up photograph of the transistor amplifiers clearly shows the 6 channels of 70mm amplifications, together with 4 channels of 35mm CinemaScope plus the single channel optical amplification. As shown, each complete channel may be replaced as easily as a vacuum tube, as it is contained in an enclosed "can" having "standard" methods of plug-in. There are no vacuum tubes in this system and therefore no thermionic or emission ground noise.

There being no switch contacts or relays in the speech circuits the "noise" created by such devices ordinarily used for selection or changeover is eliminated.

The power amplifiers, turntable and junction box are shown. Altec Lansing 40 watt power amplifiers are used.

The installation and line up time for this system was reduced to one day.

This is the first multiple channel transistorized sound system installed in the world and thus the Hillendale Theatre becomes historically an example of modern design portending a



HILLENDALE BOOTH — Booth layout showing Century American-made 70/35mm Projectors — with strong 35/70 Projection Lamps. Mr. Ned Isbeck, Chief Projectionist.

trend toward the probable obsolescence of all vacuum tube theatre sound systems.

A word might be said about transistorized amplifiers and the trend toward replacement of vacuum tube amplifiers.

A transistor sound system is the most recent product of modern engineering, research and development for motion picture theatres. The heart of such a system is the transistor. A unique combination of fused metals which are capable of amplifying small amounts of minute electrical power to the crashing power required for theatre auditoriums. These same transistors can also be used as electronic switches, without contacts, to allow the passage of this electric power or to stop it much the same as the gates of a mighty dam control the flow of water to the river below.

Thus the transistor is ideally suited for use in theatre sound systems and its characteristics can be used to do the job without introducing those distortion elements inherent in other forms of amplification. The elimination of all transformers (input, interstage or output) removes all iron cores from the amplification thereby eliminating one of the major contributing factors of harmonic distortion.

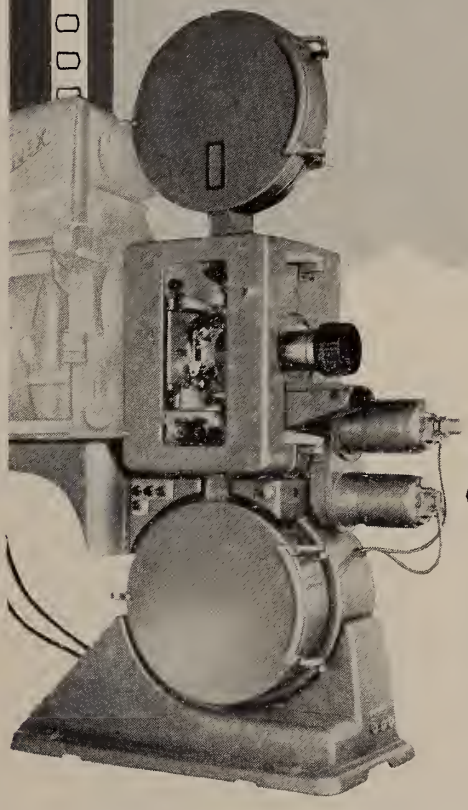
A transistor is small, sturdy and reliable. It does not wear out; there is no power consumed in its operation and therefore no heat generated as with vacuum tube systems which require filament heating and plate power loss.

The transistor is non-microphonic. This feature allows the amplification to be used without rubber mountings and eliminates all acoustical "feedback". A transistor amplifier can therefore be mounted in the same cabinet with a loud speaker or on a projector without fear of noise pickup or oscillation. This means simplified circuits, reliability and more perfect sound reproduction.

The usual requirements of frequency characteristics, noise levels and distortion are easily met. There are no limitations as to the frequency characteristics obtainable. The noise levels are comparable or better than the accepted standards of vacuum tube systems.

A feature of a transistor sound system is the manner in which the variations in light from the film are translated into electrical energy. This is done in a phototransistor having the power output equivalent to two stages of vacuum tube preamps with a regular photoelectric cell. The phototransistor is free from "microphonics", quiet and allows the exciter lamps to operate at

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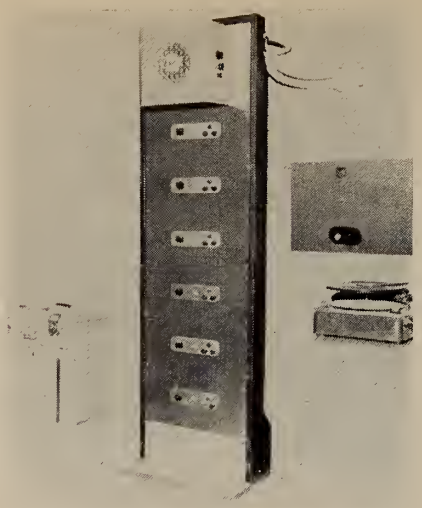
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about half "normal" voltage. This extends the useful life of exciter lamps indefinitely.

Because the transistor is small physically but big in capacity a complete channel of amplification except the power amplifier can be contained in an enclosure no larger than an average single vacuum tube. This means that it is as easy to change a complete transistorized amplifier as it is to change one vacuum tube of a conventional amplifier. The insurance of such complete interchangability leads one to believe that "normal" replacements of complete operating units will replace the time consuming, hunting for noise, loss of gain, erratic operation etc., now normally associated with older types of equipment. All of these features contribute to an insured reliability of continuous high quality theatre results.

This becomes increasingly important on the multiple channel systems (CinemaScope, Todd-AO, etc.,) where all channels are identical and complete amplifier units may be substituted instantaneously whenever necessary.

iP



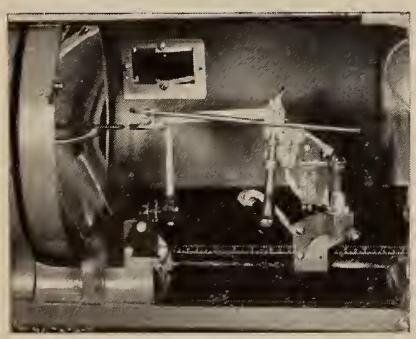
AMPLIFIERS — Rack mounted 40 watt power amplifiers — transistorized junction box — turn table.



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William Donnelly Dies in Minneapolis

MINNEAPOLIS — William Donnelly, long-time International representative of the International Alliance of Theatrical Stage Employes and a vice-president from 1954 until 1957, died at a hospital here, after an extended illness.

He was a member of Minneapolis Stage Employes Local 13, which he joined in 1920 following service in the Navy during World War I. He became President of the local in 1929 and was Business Agent from 1933 until poor health forced his retirement several years ago. He was appointed an International Representative by International President Richard F. Walsh in 1944.

He was quite active in state and national politics and in 1948 played a significant part in the first election of Hubert Humphrey as Senator from Minnesota and of Roy W. Wier as Congressman from Minnesota's Third District. Wier, a fellow member of Local 13, served six terms.

Donnelly is survived by his wife, Martha.

Sacramento Local Elects New Officers

SACRAMENTO, CAL. — J. H. Moore was elected the 1961 president of the Moving Picture Machine Operators Union No. 252, AFL-CIO here.

He and other officers were elected by secret ballot on January 3, 1961.

Other officers are William L. O'Kelly, vice president; L. E. McMillan, recording secretary; Fred A. Luckan, financial secretary; Joseph Apathy, treasurer; Walter Federolf, business agent; Wayne Mitchell, sergeant at arms; Thomas Dunn, Mario Menconi, F. A. Ornbaun, board of trustees; Harold Eichler, Robert McNulty, Robret Swilling, executive board; and financial secretary; Joseph Apathy, Federolf and Moore, delegates to central labor council.

Omar Manley installed the new officers at the close of the meeting.

iP

Technical Achievements In Line for "Oscars"

LOS ANGELES — Sixteen technical achievements of the past year have been submitted for the 33rd Annual Academy Awards consideration by Chairman Gordon Sawyer of the Scientific and Technical Awards Committee.

Meetings to evaluate the technical advances have been held and demonstrations have been conducted.

The devices are: Color-Film Analyzer, Hazeltine Research Corp.; An Automatic Shutter for Motion Picture Printing Machines, Electronic Systems, Inc.; Multiple Head Reduction Printer, Movielab Film Laboratories Inc.

Instant-Sync, Myer P. Beck; Synchronizing Device, Joseph Lombardi; Editing Attachment, Carlos C. Rivas; Ampex High Level Switching Sound System, Ampex Professional Products Co.; Kenyon KS-4 Gyro Stabilizer, Gordon Enterprises.

Flicker Indicating Device, Columbia; Panavision Panaflex Hand Held 65mm Camera, Panavision, Inc.; Panavision, Steinheil Pan-Quinon Lenses, Panavision, Inc.; Bausch & Lomb Cinephor 703 Projection Lenses, Bausch & Lomb.

Visual Image Compensator, Vicon, Inc.; Miniature Flak Gun and Ammunition, 20th Century-Fox; an Automatic Developer Replenisher System, Consolidated Film Industries; and Dual Flywheel Filtering Principle, Magnasync Corp.

iP

IATSE Calls on Members To Oppose Censorship

The IATSE today called upon its locals and members to oppose the enactment of new motion pictures censorship or classification laws by state legislatures this year.

An editorial published in the Winter issue of the organization's Official Bulletin quotes IA President Richard F. Walsh as agreeing with the Motion Picture Association in its position of strongly opposing obscene films but holding that they should be dealt with through penal statutes rather than censorship.

"A censor board, reviewing a picture in advance of its public showing," the article declares, "tends to lose sight of the basic question of obscenity and to try to take on functions of education and uplift which belong to the home, the school and the church. The motion picture, to survive as a medium of art and dramatic entertainment, must be free to give honest portrayals of life as it exists today—and as it has always existed — rather than to sugar-coat it.

"The idea of having a censor board classify certain films 'For Adults Only' is very impractical in our opinion. Many teen-agers have a quite-adult viewpoint; many others of mature years are slow to attain intellectual and emotional maturity, and some never do. Moreover, the 'Adults Only' tag is an old and disreputable one in show business — often used deliberately to lure the prurient-minded. And, finally, the classification technique becomes ridiculous when we consider the large number of parents who see movies these days at drive-in theatres with children asleep in the back seats of their cars.

"We feel that censorship and classification are unjustified, and we naturally fear them as a threat to our already-hard-hit business.

"Indications are that censorship bills will be introduced this year in more than 25 states -- including New York, Ohio, Maryland, Florida, California, Indiana, Illinois, New Jersey, Kansas, Texas, South Carolina, West Virginia and Wisconsin. We urge I.A. locals to be on the alert for them and to rally the forces of organized labor against them."

iP

25-30 Club Holds Meeting

NEW YORK — With Joseph W. Engle as its new president, the 25-30 Club of IATSE held its most recent meeting at the Claridge Hotel here.

The 25-30's year began with a meeting and banquet at the Hotel Claridge Among those present were:

Past Presidents John Krulish, Harry Mackler, Morris J. Wolheim, William B. Anderson, Hon. Nathaniel Doragoff, Abraham Kessler, and Morris I. Klapholz. Also Honorary Brothers Allen G. Smith of National Theatre Supply, Charles Renecke, Vice-Pres. of Simplex; Honorary Brother, Edward Lachman of Lorraine Carbons, Ray Gallo of International Projectionists, Honorary Brother Paul Reis and Phil Freeman of National Carbons, Honorary Brother Robert Goldblatt, Organizer of the first Motion Picture Machine Operators Union in Greater New York; Marty Bahn of Camera Equipment Co., and Arthur Worth of Diamond Carbons. Also delegations from New York Local 306, Hudson County, New Jersey, Local 384, and Nassau County, New York, Local 640.

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LETTERS TO THE EDITOR

Philips Corrects FP 20-S Data

EDITOR, IP:

We should appreciate it very much if you would be so kind as to publish the following corrections of erroneous remarks relative to the Philips FP 20-S projector with pulsed gas — discharge lamp SPP 800 appearing on page 10 of the September issue of IP:

The FP 20-S projector does not have a 5:1 movement, but a normal 3:1 movement. An accelerated movement would not be of any advantage in this shutterless projector, as the time between two light-pulses is largely sufficient for the film transport by means of a normal movement.

The SPP 800 is not a xenon lamp, but a super high-pressure gas-discharged lamp especially designed for pulsed operation. The average life of this lamp is 33 hours when at maximum load (800 W). The FP 20-S is provided with a lamp turret containing two lamps. When the lamp in operation breaks down, it is automatically replaced by the spare lamp, so that a breakdown of the lamp can never cause an interruption in the performance. The replacement of the lamp is so fast that the public does not notice it.

The light output of the FP 20-S projector is somewhat higher than that of a 50-amp. arclamp, viz. 5000 lumens with CinemaScope aperture, f/1.6 projection lens, and anamorphic attachment. Therefore a brightness of 14 footlamberts is obtained with a 38-foot wide CinemaScope picture on a Perlux screen with a reflection factor of 1.8.

The average theatre on the European continent is far smaller than the average theatre in the United States. In Holland, for example, the average is less than 700 seats, in Germany less than 600, and in Switzerland about 350 seats. Therefore, the aforementioned picture size is sufficient for more than 80 per cent of the European theatres.

The operating costs are well below those of 50-amp. arclamps. The difference varies from country to country due to differences in the cost of electricity, water, and carbons; but it could be said that the average difference is about 25 per cent.

W. J. M. JANSEN
Eindhoven, Holland

EDITOR'S REPLY:

The above subject brought up by Mr. Jansen in his letter is discussed in IP's lead article in this issue.

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S.O.S. Acquires Rights To Allen Film Processing

NEW YORK — Distribution rights for new equipment manufacturers by Allen Products, Inc., for processing 16mm reversal film have been acquired by S.O.S. Cinema Supply Corp.

The Allen equipment, called the Allen 16mm Reversal Processor, Model 700, is convertible for negative or positive films.

The design provides for daylight loading of 1,200-foot reels, variable speed drive, refrigeration and circulation, and a bleach tank of the same gallonage as the first developer tank. The film passes through nine tanks and a dry box, all in line, at speeds up to 20 feet a minute.

iP



"THE KING AND I" — 20th-Fox film to be re-released in new "Grandeur 70" process.

20th-Fox Reintroduces "Grandeur 70" Process

By JAMES M. JERAULD

NEW YORK — Twentieth Century-Fox unveiled a modernized improvement of its 70mm Grandeur film first introduced in the earliest days of sound at a private screening of "The King and I" at the Rivoli Theatre Tuesday (24).

It was so magnificent several times during the screening the sophisticated exhibitors who have seen all the wide-screen improvements broke into applause. The color, the depth of focus, the clarity, the six-channel sound which produces incomparable tones are all equal or superior to anything yet presented.

Any 70mm projector can use the new film. By reprinting some of the prize pictures of the past 20th-Fox proposes to provide a superior entertainment for all the present 70mm installations and for a wave of new installations which undoubtedly will start as soon as exhibitors discover the competitive value of the new medium.

Earl Sponable, technical expert for 20th-Fox, has been working on the new medium for a long time with his staff. It's a prize contribution in the battle to put films in a position to make television look sick.

"The King and I" bowled critics over when 20th-Fox presented it as a Rogers and Hammerstein musical with Deborah Kerr in 1956. No press agent ever dreamed up more fulsome praise than that which the critics and the public heaped upon it. It was a tremendous boxoffice success. Now it's even better. Some scenes have a stereoscopic quality that adds to the realism.

Some industry figures with long memories may confuse the Deborah Kerr-Yul Brynner production with earlier versions — Gertrude Lawrence (black and white) in 1952; Irene Dunne, Rex Harrison and Linda Darnell, earlier, but these can be dismissed from the memory. There have been many stage revivals, too, but nothing in them compared with the magnificent production values furnished by Darryl F. Zanuck in 1956. These values have been further enhanced.

Richard Rodgers, at the Rivoli showing, said: "This is the way we cinematically conceived it."

The new projection process is equipped with six magnetic sound tracks with five speakers behind the screen and a sixth off-stage, or surround sound. Sponable says it's the entertainment of the future, "the next step in the chain of growth that has brought the motion picture from the silents, to talkies, to CinemaScope and wide screen, to Todd-AO and eventually to the utmost in the 70mm process."

The color is not washed out as it was in "The Robe;" it's sharp and natural. There is no distortion in the corners of the picture as there was in "Carousel" and others.

The process decompresses, or expands, the images on the CinemaScope screen. A negative four times the area on a print, twice the width of regular CinemaScope is used. The experiments have been underway since 1941.

iP

Fred Pfeiff Is Made Norelco Manager

Fred J. Pfeiff has been designated as technical manager of the Norelco motion picture division of the North American Philips Co.

Pfeiff's immediate responsibility is with the Norelco 70/35 projector's installations and service activities.

For the past five years, Pfeiff was chief engineer of the theatre equipment division of the TODD-AO Corp., the original distributors of the Norelco 70/35 projector. In that capacity he supervised over 100 installations of 70mm equipment in the United States and Canada.

His experience in the motion picture field dates back to the early days of sound, starting with the acoustic department of the Electrical Research Products, which subsequently became the present Altec Service Co. While with Altec, Pfeiff was involved in a wide range of activities, including laboratory control, specialized equipment production, large screen TV and the introduction of CinemaScope in the United States and Europe.

iP

R. W. POTTER

LONDON — The death on Thursday, 15th September of Mr. R. W. Potter, 58, Export Manager of the G. B.-Kalee Division of Rank Precision Industries Ltd. has been announced.

Mr. Potter assisted in the building up of the considerable overseas business now enjoyed by G. B.-Kalee. He was a personal friend of many of the company's agents in all parts of the world and his loss will be sorely felt.

He leaves a wife and daughter.

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Equipment Show to Open in Paris

PARIS — The Third Biennale Internationale Photo-Cinema-Optique will be held in the Grand Palais, from November 9 - 20, 1961.

This year again, the Biennale will present all the latest improvements in the photographic, cinematographic and optical fields, and the application of the new material to civilization in general. Black and white and color photographies, amateur views and research documents will demonstrate recent achievements moving away the limits of the unknown.

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TESMA Offers Technical Advice For MPAA's West African Project

Technical advice and whatever technical information now is available and which will be available in the near future, was placed at the disposal of Motion Picture Association of America by Theatre Equipment and Supply Manufacturers Association, at a meeting last week in New York. The offer was made in connection with projected development and construction of motion picture theatres in West Africa, according to Larry Davee, TESMA president, and Ralph Hatzel, executive vice-president of MPAA, George Vietheer, administrative director of MPEA, John B. McCullough, MPAA director of technical services and other AESMA representatives, also were present.

While the MPAA's project is entirely in the exploratory stage, Hetzel explained, the MPAA will avail itself of the services and technical knowledge of American theatre equipment manufacturers. He suggested that Mr. McCullough and the American manufacturers make recommendations necessary for construction of a 1,200 seat pilot theatre, taking into consideration the problems inherent in an undertaking in an area where lack of sufficient power, high heat and humidity, etc., present different aspects in theatre construction than those presented in the United States.

During the meeting, TESMA president Davee outlined details of new and modern theatre equipment now available for a program of the scope presented by the West African plan, and told the MPAA representatives that TESMA now is formulating a new plan to provide comprehensive design and operating information to the theatre industry. This plan, when completed, might well be the basis, with modifications, under which the West African project might proceed, he declared.

The TESMA plan, Davee stated, had been conceived partially at least, to relieve the void created by the demise of the Motion Picture Research Council. It would translate into theatre operating information, the standards and practices recommended by the Society of Motion Picture and Television Engineers, and provide information to builders, theatre owners, projectionists, service and maintenance men.

Another meeting of the manufacturers and MPAA will be scheduled when Mr. Hetzel returns from an imminent additional exploratory trip to West Africa, it was announced.

Others representing TESMA in addition to president Davee, who also is president of Century Projector Corp., included V. J. Nolan, National Carbon Co.; Mary Ashcraft, C. S. Ashcraft Mfg. Co.; Arthur Meyer, Simplex Division of General Precision Equipment Co.; Arthur Bell, Bausch & Lomb Optical Co., and Frank Cahill, Century Projector Corp.

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WILLIAM GEORGE HONORED

BALTIMORE, MD. — William George, here member of Operators local 181, received a gold life membership card at the September meeting, with President George Dusman making the presentation. A projectionist since 1907, George began with the firm of Pearce and Sheck, working a 54-hour week for $12.00. He was employed at the Cary Theatre for 37 years until that house closed. He worked the first Todd-AO show in Baltimore. Now semi-retired, he puts in one full day each week at the Areo Acres. He is a former President of the local and served on its Executive Board for nearly 40 years.

iP

NTS Announces Facilities Change

W. J. Turnbull, president of National Theatre Supply Company, today announced the consolidation of the facilities of the International Division and the New York Branch Sales Office. The merger will become effective February 1st, at which time the International Division personnel will be located at the branch address, 356 West 44th Street, New York 36, New York.

According to Turnbull the move is one that has been under consideration for a long time. Duplication of facilities at two New York City locations is no longer necessary. It is anticipated that the consolidation of facilities will be beneficial to National's customers as well as to NTS itself.

Coincidental with the news, Arthur F. Baldwin, an NTS vice-president and manager of the International Division since 1944, will assume as well the managerial duties of the New York Office. Allen G. Smith, National branch manager for the past thirteen years and associated with the motion picture equipment industry for forty-eight years, will devote all of his time to promoting sales of theatre equipment in the New York area. Smith will act as NTS envoy to IATSE locals.

iP

NEW BROCHURE

The use of carbon arcs for slide projection in theatres is detailed in a new brochure now available. It tells how brilliant pictures up to 30 feet wide can be projected in rooms which need not be darkened. A table for establishing lens requirements is included. A copy of this brochure will be sent to anyone addressing a request to The Strong Electric Corporation, 10 City Park Avenue, Toledo 1, Ohio.

iP

DINNER DANCE

The Westchester County Central Labor Body, AFL-CIO will hold its First Annual Dinner-Dance on Sunday, May 21, 1961 at the Glen Island Casino in New Rochelle. The affair will be an annual one. On the Dinner Dance Committee are: Lawrence Sabatino, Hon. Chairman; Nicholas Nardozzi, Chairman; and Frank Pennella, Sec'y-Treas.

iP

DILLE TO J. M. MATHES

NEW YORK — Gordon Dille, formerly with William Esty, as publicity manager for National Carbon Company, Division of Union Carbide Corporation, is now with J. M. Mathes, Inc. here. The National Carbon account is now being handled by J. M. Mathes.

iP

Kodak Appointments

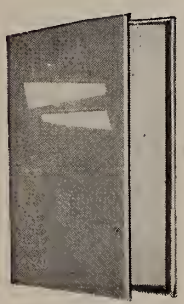
F. Gordon Foster has been appointed business manager of Eastman Kodak Company's Appartus and Optical Division, it was announced today by Herman H. Waggershauser, Kodak vice-president and general manager of the division.

He will be succeeded as comptroller by Thomas M. Bonnar, formerly assistant comptroller of the Apparatus and Optical Division.

Bonnar joined Kodak in 1938 after attending the New Bedford Textile Institute, the Worcester Polytechnic Institute, and the Bently School of Accounting and Finance. He is a native of New Bedford, Masachusetts.



How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise — how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

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270 pages, 6 x 9
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By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
8. Noise Measurements and Techniques
9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
11. Noise in Communication Systems

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PROJECTION

. . .Continued from Page 7

managements of European theatres seldom make an effort to exceed official standards of screen brightness, which ranges from 8 to 10 footlamberts. The German standard of 100 apostilbs (9.29 fL) is a fair average in Europe.

In the United States and Canada, only immense drive-in theatres fall very far below the American official minimum of 10 footlamberts. These theatres have an average brightness level of 4.74 fL for standard projection, and 5.40 for CinemaScope (a difference ratio of 1.14). Even though 53 per cent of the drive-ins included in the Research Council survey have less than 3 fL, fully 24 per cent of them have **more than** 10 fL! (Although 6 per cent of American indoor theatres have screen brightnesses of less than 10 fL, 19 per cent of them have more than 30 fL, a level rarely encountered in European theatres.)

The **actual** prevailing average indoor-screen brightness of 20 fL in America (double the official minimum) constitutes a gratifying endorsement of IP's frequently expressed opinion that screen-brightness levels should lie somewhere between 15 and 30 fL for comfortable viewing and the most lifelike reproduction of panoramic natural-color films.

Could European projectors fitted with the new xenon and mercury illuminants be used to advantage in American theatres? In a few theatres, yes, very definitely; but both the drive-ins and the palatial urban "super-dreadnaughts" can be ruled out—their screens are much too big for the new European light sources to illuminate. By using high-grain screens (unsuitable for all but long, narrow auditoriums), the most powerful of these new devices could barely "squeak by" in the average American theatre; but we wish to make it clearly understood that **only matte (85 per cent) and "pearlized" (150 per cent) screens pass the test of good light distribution and picture quality.** High-gain aluminized screens of 300 per cent axial reflectivity are unsuited to auditoriums of normal width, they must be curved for light distribution, and this distorts the pictures, and they are prone to show every wrinkle and seam. Beaded screens are absolutely taboo on account of their peculiar and manifestly unsuitable reflection characteristics.

Average Screen Requirements

The number of lumens of projection light needed to illuminate **to a level of 20 footlamberts** the average American indoor screen 35 feet wide (and 17½ feet high at an average aspect ratio of 1:2) depends upon the mean axial reflectance of the type of screen surface used in each individual case. Matte, pearlized, and aluminized screens having mean axial reflectances of 0.85, 1.5, and 3, respectively, are in common use. The screen lumens for a 35-foot picture of 20 fL brightness are thus:

Matte:	14,412 lumens
Pearl:	8,166 lumens
Aluminum:	4,083 lumens

These figures indicate that the 2400-lumen xenon equipment is much too weak for the average American theatre, and that the 4000-lumen xenon equipment and the 4500-lumen pulsed-light equipment would be suitable only when a **non-approved** high-gain screen surface is used.

If these lumen estimates be halves for 10 fL of brightness, it will be seen that the 2400-lumen xenon lamp could be used on a 35-ft. aluminized screen, and that the 400-lumen xenon and 4500-lumen pulsed-light lamps could be used on a 35-ft. pearlized screen. **But we have never, and do not now, recommend an indoor screen light level below the prevailing American average of 20 footlamberts!**

The 2400-lumen xenon projector 20 fL on screens of the following widths:

Matte:	14 feet
Pearl:	19 feet
Aluminum:	27 feet

For 20 fL with the 4000-lumen xenon projector:

Matte:	18 feet
Pearl:	25 feet
Aluminum:	35 feet

For 20 fL with the 4500-lumen pulsed-lamp project:

Matte:	20 feet
Pearl:	26 feet
Aluminum:	37 feet

Cabon Arcs for 20 fL

A wide selection of American arc lamps and high-intensity carbon trims are available to produce a brightness level of 20 fL on 35-ft. screens. When the screen is of the matte type of 0.85 reflectance, the following are recommended for projectors fitted with f/1.7 lenses and 50 per cent shutters: (Light output between 28,000 and 29,000 lumens without shutter.)

Trim 1: 10-mm Hitex pos. & 7/16" Orotip neg. at 125 A, 62V (7750 W), 18" mirror. Positive burns 19½" per hour.

Trim 2: 11-mm Reg. pos. & ⅜" Orotip neg. at 120 A, 62 V (7440 W), 18" mirror. Positive burns 20½" in./hr.

Trim 3: 13.6-mm Reg. pos. & 7/16" Orotip neg. at 145 A, 61 V (8845 W), 18" mirror. Positive burns 14½" in./hr.

For 20 fL on a 35-ft. pearlized screen of 1.5 reflectance, f1.7 lens and 50 per cent shutter: (Light output between 16,000 and 16,500 lumens without shutter.)

Trim 1: 9-mm Suprex pos. & 8-mm Orotip C neg. at 80 A, 45 V (3600 W), 14" mirror. Pos. burns 14 in./hr.

Trim 2: 9-mm Reg. pos. & 5/16" Orotip neg. at 75 A, 55 V (4125 W), 16" or 16½" mirror. Pos. burns 14 in./hr.

For 20 fL under the same conditions on a 35-ft. aluminized screen of 3 axial reflectance: (Light output between 8000 and 8500 lumens without shutter.)

Suprex Trim: 7-mm Suprex pos. & 6-mm Orotip C neg. at 42A, 36 V (1512 W), 14" mirror. Pos. burns 8 in./hr.

Still larger and brighter screens are accommodated by more than two dozen other trims and currents. Indeed, a powerful projection lamp as the Strong Jetarc having a 21-inch cold mirror, is capable of supplying a level of 10 fL on a 90-foot matte drive-in screen of 0.9 reflectance with a conventional projector (50 per cent shutter and f/1.7 lens). This lamp furnishes 46,000 screen lumens (measured without shutter) when 10-mm Ultrex positives and solid graphite 7/16-inch negatives are burned in it at 160 amps., 76 volts drop (12,160 watts), and the projector has standard aperture and f/1.7 coated lens.

The Strong Jetarc can furnish 10 fL on a 150-ft. high-reflectance directional drive-in screen with the same trim burned at 155 amps., 74 volts (11,470 watts), the positive consumption being only 8½ in./hr. And for customary 4- or 5-fL brightness level—well, no existing drive-in screen is too big for the Jetarc to illuminate!

New Sources OK for Small Theatres

The new European projection-lighting equipment is left trailing far in the rear even by simplified-HI arc lamps burning 8- and 9-mm Suprex carbons; and it virtually drops out of the running when we advance to the class of rotating-positive lamps burning 9-, 10-, 11-, and 13.6-mm carbons, both regular and Hitex, with 16-, 16½-, and 18-inch cold mirrors.

This is not to say that the low-powered European projection-lighting equipment designed to dispense with the low-intensity carbon arc and the very smallest simplified high-intensity lamps is of no use in America. Even though the most powerful of these innovations presently cannot quite meet

the 20-fL requirements of the American indoor screen of average width and approved type of surface, there are thousands of theatres having screens smaller than the 35-ft. average.

True, 33½ per cent of American indoor theatres have screens 40 feet wide and larger; but according to the Research Council report, about 16½ per cent of the indoor theatres surveyed have screens ranging from 15 to 30 feet in width. These smaller screens, particularly those of matte or pearlized surface 20-25 feet wide, can be adequately illuminated by 4000-lumen xenon or 4500-lumen pulsed-light equipment.

The use of shutterless pulsed-light projectors seems particularly desirable in view of their flickerles projection and simplicity of operation. Although extremely economical in respect to current consumption (a relatively small item in any system of projection illumination), the cost of frequently replacing quartz mercury-vapor tubes having a life of only 30 hours brings the overall expense of pulsed-light projection into the cost level of more powerful Suprex-arc projection.

5:1 Intermittents New U. S. Norm

The cost of carbon-arc projection in America has been substantially decreased by the use of 5-to-1 high-speed intermittent movements which make possible the trimming of shutter blades from the usual 90° width (50 per cent light transmission) down to 63° (65 per cent light transmission). Lamp output can be reduced to 77 per cent of normal by the use of 5:1 intermittents **for the same screen brightness,** thus effecting a significant saving in power and carbon costs. On the other hand, large drive-ins and other theatres not now enjoying adequate light levels can obtain 130 per cent their present level by using 5:1 intermittents, and **without adding a penny to the costs of of arc operation.**

It is well known that the effect of shutter-flicker is reduced by narrowing the shutter blades. The greater the ratio of light to dark periods **at the same shutter frequency,** the less perceptible the flicker becomes. This is still another advantage of high-speed intermittent movements.

Only two completely satisfactory 5:1, or 60°, intermittent movements have yet been devised for theatre projection; and both are American developments. The first was the famous Powers pin-cross movement employed in a projector now obsolete, and the second was the accelerated geneva movement designed for a modern mechanism. A similar accelerated geneva movement was previously incorporated into the Radion II, a French projector, but the speed ratio was scarcely greater than 4:1.

It is entirely possible that new 5:1, 6:1, and 7:1 accelerated geneva movements will be made available by American projector manufacturers.

While readers' requests for articles describing the new European technical developments in a detailed and objective manner will be honored by IP, we hope that the content of the present article makes it abundantly clear why these low-powered European innovations cannot serve the needs of high-powered American projection. American audiences are accustomed to motion pictures which are both big and bright, and will brook no diminution of either picture size or screen brightness. **IP**

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MONTHLY CHAT

. . . Continued from Page 3

Size Of Positive	Minimum Amps.	Maximum Amps.
9-mm Regular	70	90
10-mm Regular	85	110
11-mm Regular	105	135
13.6-mm Regular	120	160

The properties of the 10- and 13.6-mm Hitex positives are likewise different, representing maximum current densities of 1.8 and 1.3 amps/mm^2, and minimum densities of 1.5 and 1.17 amps/mm^2, respectively.

Size of Positive	Minimum Amps.	Maximum Amps.
10-mm Hitex	115	140
13.6-mm Hitex	170	190

Although difficulties may be experienced in some lamps when burning any trim at its maximum rated current, **bad light will most certainly result from burning positive carbons below their specified minimum currents.** Great savings in carbons will indeed result from underburning; but the screen illumination will be so unsatisfactory that patronage may be lost to the theatre.

The greatest offender in projection today appears to be the 13.6-mm regular positive burned in large-mirror lamps at currents between 100 and 110 amps. This carbon requires at least 120 amps. for a satisfactory volume of white light—and it doesn't matter which particular make of large-mirror lamp is being used!

About 70 per cent of the light emanating from the crater of a high-intensity carbon burned at average current comes from the luminescent gas-ball, and about 30 per cent from the incandescent carbon behind it—the glowing floor of the crater. The latter is really nothing but low-intensity light, rather yellowish in color.

When a carbon is burned below the recommended minimum current, the percentage of blue-white HI light is smaller, and the percentage of yellow LI light proportionately greater. A 13.6-mm carbon burned in the neighborhood of 105 amps. gives a low-intensity quality of light—dim, inefficient, and distinctly yellowish or brownish. High-intensity carbons give their brightest, whitest light at or near the rated maximum current.

If it is impossible to obtain more than 100-110 amps. for 13.6-mm arc lamps, the lamps should either be replaced or refitted to burn 10-mm or 11-mm regular carbons. Carbon consumption and costs will be greater, but screen light will be more than doubled in most cases of this nature, and will certainly be whiter. To repeat what we have said many times in the past, present-day moviegoers are used to bright, blue-white TV images in their homes. They have come to expect the same quality of lighting on the theatre screen.

iP

ANIMATION STAND

NEW YORK — A new brochure describing the 1961 model Tel-Animastand Animation and Special Effects Stand has just been published. It gives detailed specifications of this professional stand that compares with more expensive models.

In addition to the basic stand with compound movement, a full range of accessories is available. These include the Tel-AnimaSliding Cel Board, Shadow Box and Platen, Motorized Zoom and Automatic Follow Focus.

The manufacturer is J. A. Tanney of S.O.S. Cinema Supply Corp. The brochure is available by writing to S.O.S. Cinema Supply Corp., 602 West 52nd Street, New York 19, N. Y.



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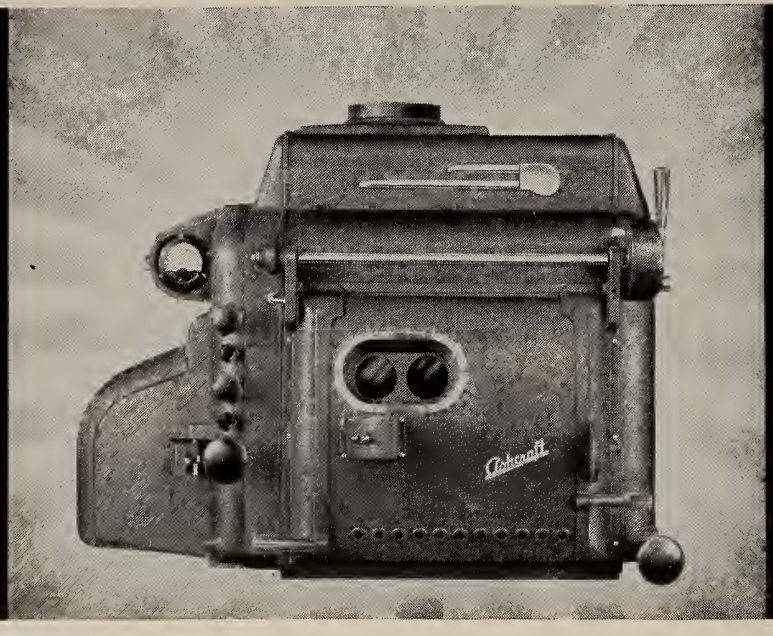
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Volume 36 **March 1961** **No. 2**

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INTERNATIONAL PROJECTIONIST, published monthly by the Internotionol Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneopolis 24, Minnesoto. Editoriol offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizobeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnoy Ploce, Wellington; ENGLAND ond ELSEWHERE—Wm. Dowson & Sons, Ltd., Mocklin St., London, W. C. 2. Subscription Rates: United Stotes, Conado, ond U.S. Possessions, $3.00 per yeor (12 issues) ond $5.00 for two yeors (24 issues). Foreign countries: $4.00 per year and $7.00 for two yeors. Chonges of oddress should be submitted four weeks in advonce of publicotion dote to insure receipt of current issue. Second-closs postoge poid at Minneopolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personol opinions appeoring in signed articles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

Print Inspection Problems

The question of motion picture print inspection procedures and the abuses which are heaped upon our film has been a knotty problem for many years — and the source of conflict between not only the distributors and exhibitors on their side of the industry, but the projectionists and film handlers on our side of the craft.

Protests have been lodged from time to time with the distributing companies, complaining that they do not allow the adequate inspection of release prints before they are shipped to theatres; the distributors on the other hand are upset over the treatment they allege the prints receive in the projection room.

Now it appears that the television film distribution system has profited by the mistakes made by the motion picture end of it for years and is adopting a very elaborate inspection system before films are distributed to television stations. It is not too late for distributors, film handlers and projectionists to take a leaf from this T.V. notebook and see that each print is thoroughly checked for scratches, breaks, sprocket tears, cleanliness and, of course, proper matching.

The distributor should allow his film handler sufficient time and money to spot the deficiencies as they crop up in the prints and to correct them. He should also allow sufficient training time either under his own direction or under the auspices of his IA local to educate these film handlers in spotting the many deficiencies which can crop up in any print from time to time.

Particularly in the smaller theatres where there is often a temptation to run new films without pre-testing, it seems that some character during the last run did not have time before his shift ended to splice; as the result of his haste (or maybe just plain laziness) your show is interrupted, your audience boos and claps, and your boss is unhappy.

Of course this type of film damage is completely beyond the projectionists' control, but an examination of our respective consciences will show that many injuries to prints are through improper handling in the projection room — this may of course include damage by worn or old style projection equipment or the careless handling by the operator. The projectionist is certainly not to be blamed if he is irritated at bad shipping containers obviously used by the distributor long after replacement was due, or the lack of proper repair of torn spots and faulty splices.

Even such things under the complete control of the projectionist, such as gate tension adjustment, are often ignored — and this is where the monkey must rest directly on the projectionist's back. If he receives prints in good condition, if the film handler has done his job properly, then it becomes his responsibility to present a technically correct film to the viewer and return the same to the distributor in as good condition as possible.

Although the film exchanges are morally and legally responsible for issuing prints in perfect running condition, it is well known that any projectionist who has too much confidence in the exchanges in this direction, or who cynically adopts the attitude "let George do it" will not be properly discharging his duties in his craft and will sooner or later come to grief with film breaks and faulty projection. Along with the routine of preparation for a show which sees the cleaning and oiling of projectors and normal adjustments in the equipment is film inspection — because of the danger of damaging the projectors as well as the damage of creating annoyance and dissatisfaction with the projected picture.

INTERNATIONAL PROJECTIONIST

Volume 36 March 1961 Number 3

IATSE Men Point Out Contrast in Release Print Inspection Procedures

For a number of years, according to the Winter IATSE Bulletin, Film Exchange Employes locals have been protesting against the failure of the distributing companies to provide for the adequate inspection of release prints before they are shipped to theatres throughout the United States and Canada.

This is in direct contrast to the inspection policies of those companies distributing films to TV stations.

Their procedure is described by M. L. Rexroth, President and Business Agent of Los Angeles Local B-61:

"Every film, before it goes to a TV station, is thoroughly checked for scratches, breaks, sprocket tears, cleanness, proper label, proper matching, title, beginning and end credits, commercials and other pertinent data. This is done prior to each and every showing by each new station."

Similar descriptions of the TV-film inspection job are given by International Vice-President Jerry Tomasetti, who is Business Agent of New York Local B-51, and Frank Lingenfelser, Secretary-Treasurer of Chicago Local B-45. Brother Lingenfelser explains also that footage meters are used to make sure the running time of each film is correct.

Typical of the firms supplying television films are AFP Distributors, Inc., of New York. AFP guarantees the transmission quality of each print it ships. The Local B-51 members working there have been trained to recognize on sight each of 20 defects for which prints are automatically rejected. White cotton gloves are worn by all film handlers. Equipment and facilities maintenance is at an extremely high level to minimize film damage, and the exchange is air conditioned with filtered and humidified air. Only shipping labels are gummed; any label used on or near film is of the pressure-sensitive type, thus eliminating the remote possibility of water damage.

The same type of care is exercised by the two other TV film distributing companies with which Local B-51 has contracts — Modern Television Service, National Telefilm Association, Bonded Film Company, Screen Gems Exchange and MGM-TV Exchange.

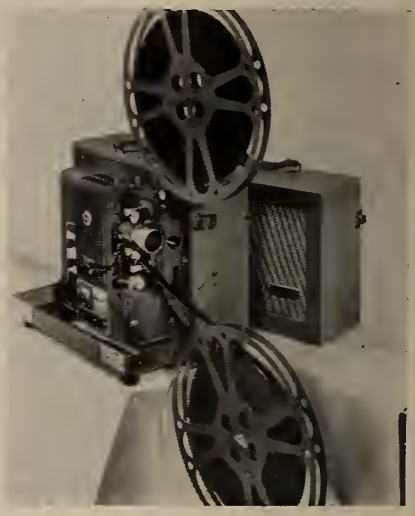
N.T.A. also ships out of Chicago and there employs members of Local B-45, which likewise has contracts with Bonded Television Service, Hollywood Television Service, Governor TV Productions, M.C. Pictures, KCOP (Crosby-Brown) and some smaller independents.

On the West Coast, Local B-61 has members employed by Bonded TV Films Company, Screen Gems Exchange and MGM-TV Exchange.

Each of the three exchange centers services stations over a wide area. For example, 67 are serviced out of Chicago, and prints are shipped from Los Angeles to stations as far away as Kansas, Louisiana, Arkansas, Minnesota, Missouri, Virginia, South Carolina, Georgia, Florida, Pennsylanvia, New York, Alaska, Hawaii and Guam.

IATSE MEN MEET

About 100 executives, members of the N.Y. City IATSE local unions 306-702-771-644-52-H63-B51-764-161-751-841, held a reception for the I.A. Official Family on the Roof Garden of the Hotel Pierre, New York. The entire arangement was under the direction of Ernest Lang, executive secretary of Local 306. This Executive Board meets about four times a year, and usually in New York, where the official family of the 11 New York Locals hold some sort of a reception. Harry Lennon and his music men supplied the entertainment. Local 306 has paid out over $7 million in pensions, retirement and death benefits to more than 450 members out of a total membership of 1500. Nearly 300 members are still enjoying some of these benefits initiated by this welfare-minded board. Such hard working executives as Ernest Lang, Steve D'Anzillo and Harry Garfman, have dedicated themselves to improving the working and welfare conditions of members of No. 306.



One of the hardest-working parts of a movie projector is also one of the smallest — a tiny tooth.

This tooth, which is part of the pull-down claw, engages the film perforations over 50,000 times during a 40-minute movie to pull the film past the projection lens. Yet, when the tooth is made of tungsten carbide, probably the hardest substance made by man, as it is on the Kodak Pageant Sound Projector, (shown above) it shows no noticeable wear througout the long life of the projector.

Shown below is the pull-down claw in the Kodak Pageant Sound Projector. The teeth engage the film perforations to bring the film down past the projection lens. The tooth on the right is made of tungsten carbide, as it must stand up to the hardest wear the carbide is supplied by Carmet, the carbide producing facility of Allegheny Ludlum Steel Corporation.

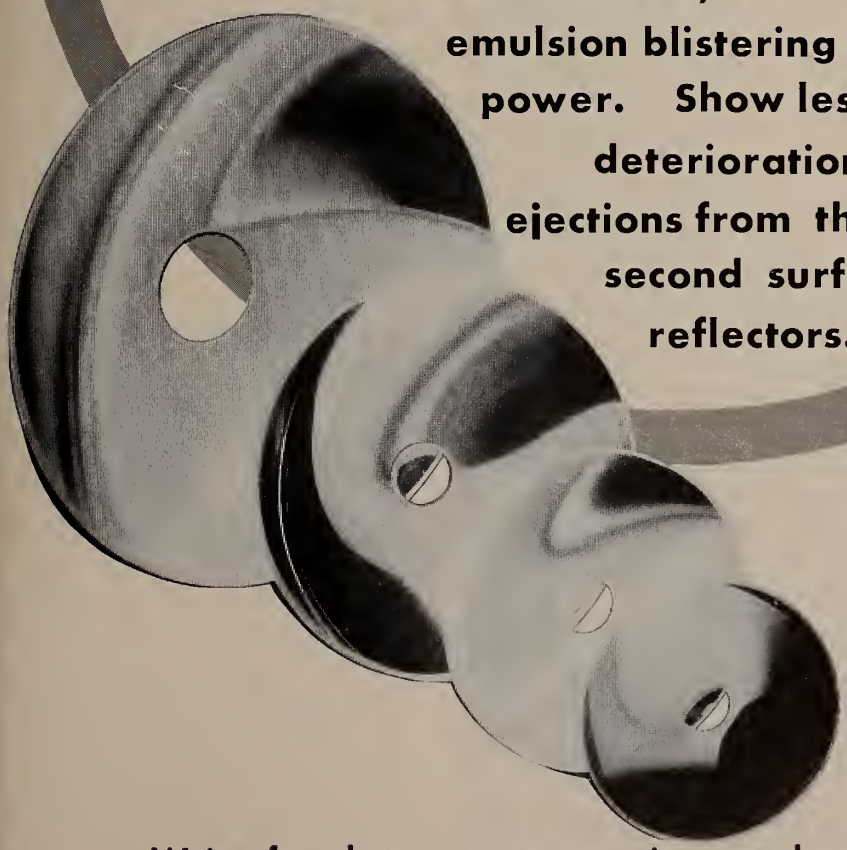


Strong

FIRST SURFACE
(Front Coated)
TUFCOLD
DICHROIC MIRRORS

New Long-Service Reflectors for Reducing Light Loss

Projected light is reflected from the front surface and without passing through the glass twice as with second surface mirrors. They maintain maximum screen illumination, reduce film buckle, and improve focus. No emulsion blistering regardless of arc power. Show less coating deterioration or pitting by ejections from the arc than second surface reflectors.



New reflectors afford the lowest cost way to picture brightness.

How long since you last replaced yours? You should do so regularly.

Write for data on correct sizes and type for your lamps.

THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE • TOLEDO 1, OHIO

Manufacturers of Reflectors for 25 years

New Arc Mirror

By ARTHUR J. H

(Part 1 of 2 parts)



FIG. 1 — A circular disc of flat glass is placed over a reflector-forming mold preparatory to treatment in the "bending furnace" where the glass is heated to the softening point and sucked down by vacuum to make perfect contact with the accurately ground and polished surface of the mold.

WHEN OLD, worn out arc lamp mirrors dull your screen, it's time to brighten up with a pair of Strong replacement reflectors. Patrons appreciate the difference! Presented in this article are useful data on the optical action, line-up, and care of silvered glass reflectors.

The brilliant, crystal-clear presentation of modern movies on giant screens is made possible by the silvery, jewel-precise reflectors in the arc lamps of those wondrous machines, the motion-picture projectors. In fact, the success of any theatre, drive-in or conventional, is wholly dependent upon the quality and condition of the arc-lamp mirrors.

The first projection arcs, woefully inadequate by today's standards, employed small condensing lenses instead of large mirrors. The reflector type of lamp, popularized by the late Harry Strong in 1925, revolutionized projection technology. Mirrors are capable of delivering vastly more light to the screen than condensing lenses can, and at lower cost. Thanks to two early Strong reflector lamps, the "Hy-Lo" of 1928 and the "Mogul" of 1933, the daylight-white brilliance of high-intensity reflector-arc illumination came within the reach of every theatre, large or small.

Although condensing lenses lingered on in a few arc lamps of early design, the well-known Strong family of automatic large-mirror lamps decisively established the supremacy of the high-intensity reflector arc for the brightest, whitest, most economical illumination of theatre screens. These Strong lamps include the "Mighty 90" (1949), the "Super 135" (1953), the "Ultra Hi-Intensity" (1956), the "Jetarc" (1958), the "35/70 Special" (1959), and the new "U-H-I-" (1960).

Strong Makes Quality Reflectors

In order to function properly, the reflector of an arc lamp, like any other component vital to the projection process, must embody the very best materials and the highest standards of craftsmanship. This is why the Strong Electric Corp., famed as the world's largest manufacturer of projection lamps, established its own optical department in 1935 for the production of reflectors of assured quality.

ighter Projection

nt, Strong Electric Corp.

Strong replacement reflectors are available for both Strong and all other American reflector-type arc lamps, old and new.

Every production step in the manufacture of Strong reflectors from the optical designing and blank forming, through precision polishing, to silvering and final inspection is supervised by experts. The brilliant film of pure silver coated upon the rear surface of the polished glass is protected by a layer of electroplated copper and either an aluminum or water base high temperature paint and then baked. And the glass, itself, is of special quality and carefully annealed for durability and long life under the stresses and strains of daily use.

Even so, any arc-lamp mirror is necessarily exposed to violent extremes of temperature and to "pitting" and "scumming" by the carbon arc which blazes fiercely only inches away from its polished optical surface. Such severe conditions unavoidably result in a gradual reduction of reflective power and a dimming of the projected pictures.

Deteriorated Mirrors Waste Light

Continued use of arc-lamp reflectors which are pitted, frosted by scum, and otherwise damaged is a wastefully expensive practice. If the arc current be increased to compensate for the loss of light, the excessive consumption of electric power and carbons represents a dollars-and-cents loss which is truly alarming when extended over a protracted period of time. On the other hand, if the arc current be not increased, the exhibitor is nonetheless paying for power consumption and extra carbons which **should,** but **do not,** contribute a single lumen to the brightness of the picture on the screen.

Every projectionist strives to operate his lamp equipment at peak efficiency; but even more serious than immediate monetary loss to the exhibitor is the poorer quality of projection attendant upon the continued use of deteriorated mirrors. Dim, discolored, or unevenly illuminated pictures create audience dissatisfaction, and audience dissatisfaction ultimately results in a loss of patronage.

Much has been written in technical journals concerning the respective merits of the different types of arc-lamp



FIG. 2 — The formed mirror blank is removed from the mold and then transferred to a conveyor-belt "annealing oven" in which it is cooled slowly and uniformly to assure freedom from strain.



FIG. 3 — After edge-trimming and the cutting of the center hole with a diamond tool, the concave blank is individually ground and then placed with other precision-ground blanks in a power-polishing machine where both surfaces are polished.

New Arc Mirror for Brighter Projection

By ARTHUR J. HA[illegible]esident, Strong Electric Corp.

(Part 1 of 2 parts)



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reflector, namely, silvered-glass, metal, and interference-type ("cold") mirrors. The conclusions of testing engineers and the actual experience of practicing projectionoists attest overwhelmingly to the superiority of glass mirrors, both silver-coated and "cold".

Glass Reflectors Preferred

The earlier metal mirrors were made of steel and plated with rhodium, a platinum-like metal. A much-publicized advantage of these mirrors was freedom from breakage and resistance to pitting by copper splashes from copper-coated carbons.

Unfortunately, the substantially lower light-reflecting power of metal mirrors was often overlooked. The metal surface is generally not as specular as is a polished glass reflector since the metal surface cannot be polished to the same degree as glass. This fact, alone, accounts for much of the lower efficiency of metal mirrors.

The rhodium reflective coating of the earlier metal mirrors has, on the average, only 83% of the reflectivity of silvered-coated glass. Also, the reflectance of rhodium is spectrally non-uniform, imparting to the reflected arc illumination a slightly amber tint.

Most serious of all, the heat-producing infra red radiation which is partially absorbed by the glass of a silvered mirror is almost totally reflected by metal mirrors of all types. Accordingly, the use of metal mirrors involves the risk of excessive film buckling, the cracking of heat filters, and possible irreparable damage to the projection lenses.

A more modern type of metal mirror has a somewhat higher reflectance than rhodium-plated steel. This is the aluminum mirror having a specially anodized reflecting surface. The reflectivity of this surface is only a few per cent lower than that of silver; but the absence of optical precision results in a serious loss of light. Glass mirrors yield to the screen up to 25% more light than metal mirrors of the same sizes.

Mirror Optics Based on Ellipse

Owing to the fact that arc-lamp reflectors are required to form an accurate optical image of the radiant crater of the positive carbon on or near the film aperture of the projector, the adjustment of the mirror in relation to the optical components of the arc lamp and projector merits the most careful attention.

Imagine an arc-lamp reflector cut in half through its center. The gently curved cross-section is a segment of an oval-shaped geometric figure known as an **ellipse.** For this reason, standard arc reflectors are called "elliptical" mirrors.



FIG. 4 — The polished mirror is hand-finished, chemically cleaned, silvered, and then backed by copper-plating and either an aluminum or water base high temperature paint and then baked. Even though inspection follows each step of manufacture, the finished silvered mirror is carefully tested for optical accuracy before being packaged for shipment. The results of the optical tests are recorded and filed for each Strong mirror according to the serial number etched thereon.

Now, a straight line drawn through the long dimension of the imaginary ellipse intersects the mirror at its center. This line is called the **major axis** of the ellipse. And when the mirror is correctly installed in the lamphouse, and the lamp properly adjusted, the major axis of the mirror coincides exactly with the **optical axis** of the entire projector, passing through the centers of the mirror, positive crater, film aperture, and projection lens.

The all-important procedure of "lining up" an arc lamp consists in making the major axis of the imaginary mirror-ellipse coincide in this way with the lamp and projector optical axis, which is a straight line passing through the centers of all the aforementioned components. This can be accomplished by the use of a tightly stretched string and a dummy lens, by means of special alignment tools supplied by the lamp manufacturer or his dealer.

There are two definite points on the mapor axis of an ellipse called **foci,** the center of the ellipse lying halfway between them. When an arc lamp is correctly adjusted, the bright gas-ball in the crater of the high-intensity positive carbon will occupy the focus nearest the reflector (3¾ to 67/16 inches from the center of the reflector, depending upon the make and model of lamp), while the "spot", or magnified image of the luminous crater, will be found at the other focus on or near the film aperture of the projector. This set-up is illustrated in the accompanying diagram (Fig. 5).

Working Distance and Arc Focus

Screen illumination is at its best only when the arc-lamp reflector is new and bright **and when the optical line-up has been accurately established and the positive crater placed in the geometric focus of the reflector.**

To meet the last-named requirement, it is necessary to place the mirror at the prescribed "working distance" from the 35-mm projector aperture (24 to 41 inches, depending upon make and model of lamp). This distance is measured from the center of the mirror (or the edge of the center hole) to the film aperture, and is usually shortened to place the actual crater image closer to the projection lens when 70-mm prints are shown with special 35/70-mm all-purpose lamps. This expedient places a wider beam of light at the 70-mm aperture, insuring adequate coverage with acceptably uniform illumination.

If the tip of the positive carbon be positioned a fraction of an inch too close to the mirror, the yellowish "shell light" will be focused upon the aper-

ture, and the projected picture will be dim and brownish. And if the end of the positive carbon be **too far** from the mirror, the picture will be dim and bluish because the arc stream, not the white gas-ball in the crater, will be in focus. The maintenance of the correct arc focus at all times for a constant, snow-white light of maximum brilliance is the job of the arc-control and cabon-feeding mechanism of the arc lamp.

Efficiency of Modern Mirrors

The optical efficiencies, or "speeds", of modern arc lamps have been substantially increased for the projection of CinemaScope and other wide-screen films by the use of reflectors larger than those formerly employed.

The speed of any lamp can be expressed by an "f-number" obtained by dividing the working distance **minus the depth of the mirror curvature** by the diameter of the mirror, all in the same units of linear measurement, such as inches. Whereas the older lamps had speeds of from f.2.5 to f.2.3, modern lamps employing 16½″, 18″, and 21″ mirrors have speeds ranging from f/2.0 or f/1.9 to f/1.7 or f/1.6. The resulting wider angles involved in the light beams obtained from the newer lamps naturally require "faster", large-diameter projection lenses for maximum light utilization and brighter pictures on today's wide screens.

Faster optical speeds are largely responsible for the tremendously gratifying success of the new large-diameter mirrors in meeting the greater light requirements of projection on giant panoramic screens. Still another chapter of this "success story" is to be found in the greater light-collecting power of large-diameter mirrors. These reflectors intercept "solid angles" of arc radiation ranging from 120° to 152°, and even more, while the new Strong Jetarc lamp with its 21-inch main mirror and special auxiliary mirror has an **effective** light-collection angle of more than 260°! This is a far cry indeed from the 45° collection angle of old-style condenser lamps.

The shorter the arc-to-mirror distance, the greater the collection angle and the **magnification** of the image of the positive crater upon the aperture plate of the projector. A magnification of from about 5 to 7½ diameters is used, and is necessary because the actual luminous crater is much smaller than the 35-mm film aperture. This is as it should be. The remarkably high optical efficiency of the carbon arc as a projection illuminant is due to the **concentrated nature** of the light source.

Magnification of the crater image (very nearly 5.4 diameters in modern large-mirror lamps) is the ratio of the image-to-mirror and crater-to-mirror distances. The amount of magnification is established by the manufacturer of the lamps when he designs them. He provides enough magnification to insure adequate corner-to-corner coverage of the film aperture with smooth, brilliant illumination. Needless to add, the lamp designer's intentions can be realized in practice only when the utmost optical precision is built into the reflector as an integral ingredient.

Mirror Maintenance Essential

The preservation of arc-lamp mirrors in a state of good condition for as long as possible is an important part of the projectionist's duties. It is equally his job to urge the immediate replacement of damaged and deteriorated reflectors.

Although the life of mirrors can be extended by exercising care in striking the arcs and keeping the glass surfaces scrupulously clean at all times, a gradual loss of reflective power with long periods of use is inevitable. To repeat: the waste of carbons and power caused by pitted and "burned" reflectors is very serious, but the loss of patronage by projecting badly lighted pictures is a risk no theatre can afford.

The two carbons should be separated quickly when an arc is struck. Only in this way can the danger of severe "sooting" of the mirror be avoided Black soot absorbs and releases heat so rapidly that inequalities in the heating of the glass, with the development of mirror-cracking strains, are inevitable. A sooted mirror may break during projection or while it cools off after the reel has been run.

Cracked and chipped mirrors should be replaced without delay in order to restore full light to the screen and to avoid the possibility of complete breakdown and loss of light during a show.

Severe pitting of the reflectors in simplified high-intensity lamps by molten copper can be minimized by placing a wad of steel wool or a copper-net cleaning pad in the ashtray under the arc to catch the copper drippings and prevent them from splattering upon the mirror.

Mirror-Cleaning Procedures

Avoid wetting the backing compound when cleaning arc-lamp reflectors with water. Arc dust should be wiped from the glass surface with a soft, dry cloth; burned-in copper splashes may be removed with a razor blade; and the white scum washed off with water and soap or Bon Ami scouring powder. Stubborn deposits may require the cautious use of steel wool.

(Continued on Page 18)

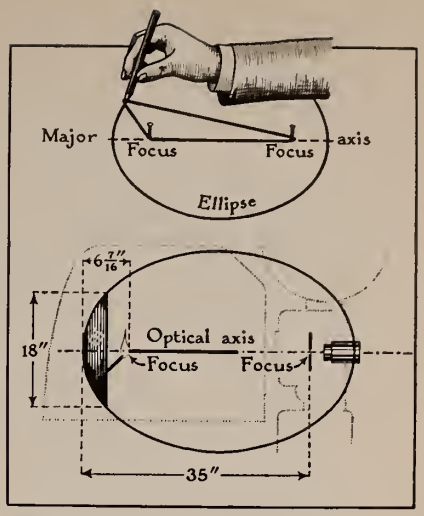


FIG. 5 — The optical action of arc-lamp reflectors is based upon the geometry of the ellipse. The "major axis" and the two "foci" are important elements in the alignment and optical adjustment of arc lamps for maximum illumination efficiency. The "working distance" is the distance between the film aperture and the center of the mirror, and should be established as closely to the lamp manufacturer's specifications as possible to insure the correct size of "spot" on the aperture plate.



FIG. 6 — The intensely luminous gas-ball in the crater of the high-intensity positive carbon should be positioned at the "geometric focus" of the reflector for the brightest, whitest illumination of the projected pictures.

H. G. Place Retires as Founder Chairman Of General Precision Corp.

NEW YORK, N. Y. — H. G. Place, who headed General Precision Equipment Corporation, New York during the period of its major acquisition of electronic and other companies, retired as Founder Chairman as of January 1, 1961 it was announced today.

Place will continue to serve as a member of the Board of Directors and as a consultant with his offices in the New York office of GPE, which will move on or about February 1, 1961 to 220 East 42nd Street, New York. General Precision corporate headquarters is moving around the same time to its new building at 50 Prospect Ave., Tarrytown, N. Y.

Place served as GPE President from 1947 to 1952, Chairman of the Board from 1952 to 1959 and since April, 1959 as Founder Chairman. During this period, General Precision sales grew from 28 million to over 215 million dollars, and the corporation now has six principal subsidiaries with plants in 20 cities and 16,000 employees. In these years, the company developed an increasingly important leadership position in the areas of advanced electronics, inertial and doppler self-contained navigation and computers for military and business use and air traffic control. During this period also, the company acquired what are now its Kearfott and Link Divisions and the subsidiaries, Graflex and Shand and Jurs. The company's GPL Division has particularly pioneered advanced air traffic control systems and the Librascope Division similarly has been in front in developing computers and computer systems for missiles, space vehicles and anti-submarine warfare, including those relating to Polaris, Asroc and Subroc. **iP**

Strong

RED ARROW SELENIUM RECTIFIERS



The dependable, economical power source for angle or coaxial trim lamps.

Glass insulated transformers withstand 150° F. higher temperatures, than cotton, permitting emergency operation of two lamps on one rectifier.

Damp-proofed stacks. Heavy duty fan. Line control relay. 8-point dial switches for adjusting power output during operation, and compensating for line phase unbalance.

3-PHASE—
60 to 100 Ampere
90 to 135 Ampere
120 to 180 Ampere

SINGLE PHASE—
70 to 90 Ampere
90 to 135 Ampere

THE STRONG ELECTRIC CORPORATION
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NAME_____
THEATRE_____
CITY & STATE_____

Eastman Kodak Enters Magnetic Tape Field

ROCHESTER, N.Y. — Eastman Kodak Company will manufacture and sell magnetic recording tape, beginning later this year, the company made known today.

Entry into the magnetic tape field represents a new but not unexpected step for Kodak, the company's announcement said. Kodak's French associate company, Kodak Pathe, has been producing and selling quality tape abroad for more than twelve years in a program that has been backed by extensive research and development in France and in Rochester laboratories.

Initially, Kodak magnetic tape will be supplied for professional and amateur sound recording uses. It will be on triacetate base and packaged in rolls ¼-inch wide in standard lengths.

M. Wren Gabel, Kodak vice-president and general manager, said that the company's long experience with film manufacturing technology affords it a good background for the production of quality tape.

"Kodak's traditional concern in film making for cleanliness and uniformity of product, for knowledge of emulsions and bases, for advanced coating techniques, all relate well to tape production," Gabel said.

Sale of tape for the popular home-recording uses will be through Kodak's regular distribution organization of established photographic dealers, many of whom are already familiar with the sale of tape recorders and related materials, he said.

In its professional motion picture film business, the company has also been in close touch with customers who use professional magnetic tape, and the professional motion picture sales division of the company will handle the distribution of Kodak tape to this professional trade, Gabel said.

F. G. Ramback Named National Sales Manager For Ampex

Frederick G. Ramback has been appointed national sales manager of Ampex Professional Products Company, according to Harold S. Salzman, marketing manager.

In the newly-created position, Ramback will direct sales activities for all professional audio and video equipment manufactured and distributed by the company, a division of Ampex Corporation. Products include the Videotape television recorder, a complete line of professional audio tape recorders and duplicators, and the Marconi Mark IV 4½-inch image orthicon television camera.

Ramback formerly was responsible for sale of private line communications for broadcasters and other commercial customers of Pacific Telephone and Telegraph Company. He joined American Telephone and Telegraph's long lines division in 1952 following his graduation from Monmouth College with a degree in business administration. He supervised recruitment-training programs and sales in the Chicago, Kansas City and Minneapolis districts before transferring to San Francisco in 1957.

Currently president of the Monmouth College Alumni Association, Ramback also is a member of the American Chemical Society. **iP**

New Book on Animation Techniques

"Animation Art in the Commercial Film" published recently by Reinhold Publishing Corporation, New York, deals with the techniques of animated film.

To give the reader an over-all concept of the procedures involved in making an animated film, the production of a typical one-minute TV commercial is outlined. There are also chapters dealing with the latest technical developments and modern production methods used in making animated films. Some of the subjects covered are The Story Board, Bar Sheets, Cartoon Characters, Exposure Sheets, Timing, Squash and Stretch, Lip Synchronization, Flipping, The Animation Camera and The Optical Printer.

The author of the book Eli L. Levitan, has worked in the animation field for over twenty-eight years. Besides collaborating on many important technical improvements in animation equipment, Levitan worked on the first two reeler, "Sinbad the Sailor," and on "Gulliver's Travels" — the

BalCOLD® REFLECTORS CUT HEAT IN HALF

Read this Hollywood test report. "Film gate heat at 1.85 aperture, is 280° F. with silvered reflectors, but only 140° F. with BalCOLD." And look at the benefits when BalCOLD Reflectors cut heat in half:

NO FOCUS DRIFT. As much as 5400 feet of film have been run *without* refocus. Cooler film gate cuts down film bulge—keeps constant focus.

GREATER DEPTH OF FIELD. Less film bulge means better background resolution, color fidelity, and clearness of detail.

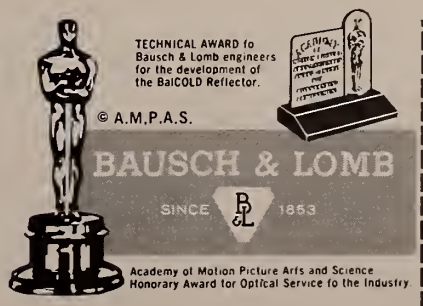
NO END-OF-REEL CONTRACTION. Lens and projector parts can't cool off and contract (thus changing focus) because BalCOLD Reflectors don't let them get hot enough to expand!

NO EMULSION PILE-UP. Green film never gets hot enough to leave emulsion coatings on film tracks and shoes.

LONGER REFLECTOR LIFE. Theatres all over the country report up to 17 months and more constant, top-quality performance.

LONGER FILM LIFE. Theatres report film life doubled with BalCOLD Reflectors. Means a lot when prints cost up to $10,000 ea.

Next time you replace silvered reflectors, replace them with BalCOLD—the only reflector whose proven contribution to the advancement of motion picture projection has won for its designers the highly regarded technical award from the Academy of Motion Picture Arts and Sciences.



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City ..... *Zone* ..... *State* .....

first feature-length animated cartoon.

One of the commercials which Levitan directed won several major awards in this country and then proceeded to take the top prize at the Venice International Advertising Film Festival and a top prize at the Cannes Film Festival.

Advisor and consultant for many studios, Levitan's home base is at the Paramount Pictures Animation Cartoon Studio. **iP**

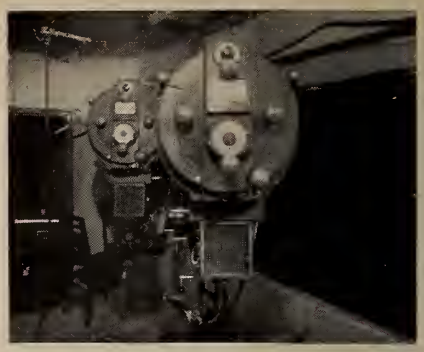
Strong Introduces New Spotlight

A new direct current carbon arc follow spotlight designed to project an intensely brilliant uniformly illuminated spotlight and wide range flood at short throw has been announced by The Strong Electric Corporation.

Designated as the Super Trouper Short Throw Special, this equipment delivers a snow-white light which is 2½ times the intensity of previous equipment which afforded similar coverage. It furthermore permits an inclusive light coverage which is twice that of previous equipment of comparable power. These advantages are particularly appreciated where a large floor, platform or stage must be brilliantly lighted from a short distance.

A self-contained power supply unit consisting of a transformer and selenium rectifier, eliminates the need for maintaining separate and expensive rectifiers or generators. It draws only 20 amperes from a 110-volt convenience outlet.

The optical system uses a silvered glass reflector to collect the illumination from the source and direct it to a circular aperture, from where it is projected to the stage by means of a two-element variable focal length lens system, controlled by a single lever.



STRONG SPOTLIGHT — The first installation of the Super Trouper Specials has been made at the Latin Quarter in New York City.

Documentary Film Nominations Announced

Nominations for Documentary Awards of the Academy of Motion Picture Arts and Sciences were announced today by Valentine Davies, president.

A special Documentary Awards Nominating Committee, headed by Edgar Preston Ames, screened entries from producing units throughout the world and, by secret ballot, selected:

Documentary Features: (over 3,000 feet) "The Horse With the Flying Tail," Walt Disney Productions, Buena Vista Distribution Co., Inc., Larry Lansburgh, producer; "Rebel in Paradise," Tiare Company, Ralph W. Luce, producer.

Documentary Short Subjects: (under 3,000 feet) "A City Called Copenhagen," Statens Filmcentral, Danish Government Film Office (Danish); "Beyond Silence," United States Information Agency; "Giuseppina," James Hill Production, Lester A. Schoenfeld Films, James Hill, producer (British); "George Grosz' Interregnum," Educational Communications Corporation, Charles and Altina Carey, producers; "Universe," National Film Board of Canada, Lester A. Schoenfeld Films, Colin Low, producer (Canadian).

The Documentary Awards Committee is composed of experts in the documentary film field, selected and appointed by the Academy president.

Final screening of the nominated features and short subjects will be held March 1 at the Academy Award Theatre. At that time, active Academy members present will view the films and select their single choice for the winning documentary achievement in each classification.

Winners will be announced April 17 at the 33rd Annual Academy Awards Presentations which will be carried over the combined radio and television facilities of ABC and the Canadian Broadcasting Company.

Documentary films are defined as those dealing with significant historical, social, scientific, or economic subjects, either photographed in actual occurrence or re-enacted, and where the emphasis is more on factual content than on entertainment. The purely instructional film is not considered.

A recent rules change, designed to stimulate entries from abroad, provides that documentary films no longer need be shown in the United States to be eligible for a Documentary Award, but that films may have their first showing in any country during the Awards year.

The new rule also states that entries must have significant dialogue or narration in English, or English sub-titles.

Entries are limited to films either produced in, or enlarged to, 35mm. Only one entry in each classification will be accepted from each producing unit.

The Documentary Awards were instituted in 1941.

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SEE YOUR CENTURY DEALER . . . . for bigger, brighter projection.

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NORELCO PROJECTORS—North American Philips Co., pioneers in the field of 70 mm projection equipment and developers in conjunction with the American Optical Company of the "Norelco 70/35" projector will sponsor the March 24 evening performance of 20th Century-Fox's "THE KING AND I," presented in the newly conceived "Grandeur 70" process at the Rivoli Theatre by the New York City Center Light Opera Co. The developers of the first practical and compatible 70 mm projection equipment will be host to hundreds of engineering, technical, exhibition and distribution leaders at this second night showing of the Rodgers and Hammerstein musical comedy. It was announced earlier that the United Nations High Commissioner for Refugees will benefit from the premiere performance on March 23. The "Norelco 70/35" projector is in use in 120 theatres across the country. The Rivoli in New York is the first such equipped house to show the new "Grandeur 70" process.

iP

Five Research Associates Appointed at Kodak Labs

The appointment of five senior research associates at the Eastman Kodak Company Research Laboratories has been announced by Dr. Cyril J. Staud, Kodak vice-president in charge of research.

They are Dr. John W. Gates, Dr. Robert Griffith, Dr. David L. MacAdam, Dr. Delbert D. Reynolds, and Dr. Carl W. Zuehlke. The title of senior research associate is reserved for those who have made a significant contribution over a number of years to the work of the laboratories.

New Film Processing Company Announced by MGM and Kalvar

Joseph R. Vogel, president of Metro-Goldwyn-Mayer Inc. and Alfred Jay Moran, president of Kalvar Corporation, today announced the formation of a new equally-owned company which will have the exclusive right to develop and market Kalvar photographic products in the field of motion pictures and television, and in certain areas of the still amateur photographic field.

Kalvar is engaged in the development and production of film under a revolutionary new process which does not require chemical processing. It takes photography out of the dark room. Kalvar's films are exposed by light to form the latent photographic image, and heated to develop the image.

The system is unique in that the opaque area of the film is composed of light-scattering centers rather than the light-absorbing ones of conventional photographic film. This is the opaque area appearing white to the eye, but because of a stop light in the white opaque area it projects as black.

Chief commercial use of the Kalvar process to date has been in the copying of microfilm images for industry and government. Extension of the process into various other forms of photography and copying is being rapidly developed.

In announcing the agreement, Vogel said, "The successful development and application of the Kalvar process would have far-reaching effects in the field of motion picture and television production, providing quality and speed with reduction in both time and cost involved."

Moran said, "Combined efforts of MGM film technicians with experienced experts in the Kalvar process will contribute substantially in these fields."

iP

Ampex Introduces New Videotape Recorder

REDWOOD CITY, CAL. — Ampex Corporation has introduced a new television tape recorder specifically designed for closed circuit, non-broadcast applications in educational, industrial, and governmental fields.

In 1956, Ampex introduced the first commercially acceptable videotape recorder for broadcast use. Ampex will continue development and manufacture of broadcast standard videotape recorders.

REDUCE LIGHT LOSS

with the New Long-Service

First-Surface (front coated)

Tufcold Dichroic Mirrors

1 Projected light is reflected from the front surface and without passing through the glass twice as with second surface mirrors.

2 Maintain maximum screen illumination, reduce film buckle and improve focus. No emulsion blistering regardless of the power of the arcs.

3 Show less coating deterioration or pitting by ejections from the arc than second surface reflectors.

NEW reflectors afford the lowest cost way to picture brightness. How long since you last replaced yours? You should do so regularly.

Write for data on correct sizes and type for your lamps.

THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE · TOLEDO 1, OHIO

Manufacturers of Reflectors for 25 Years

April 30 Target Date for TESMA Report On Theatre Operation Standards

The TESMA Theatre Coordinating Survey Committee, headed by Arthur Hatch, Strong Electric Corp. of Toledo, reported this week to the TESMA Board of Directors that his committee had set a target date of April 30th to present its complete report on clarifying standards of operation for theatres. The Hatch committee again met immediately at the conclusion of the TESMA Board of Directors meeting, which took place at the office of V. J. Nolan, National Carbon Co., 270 Park Ave., New York.

President Larry Davee, presiding at the Directors' meeting, told the group of his special committee's meeting with Ralph Hetzel, and other executives of the Motion Picture Association of America, and of its tender of advice and assistance in the projected construction of a 1,200 seat pilot theatre in West Africa. He explained that upon the return of Mr. Hetzel from West Africa, where he now is conducting an exploratory mission, the TESMA and MPAA committees again will meet to continue TESMA's offer of aid, including specific recommendations for the projected West African theatre.

Enlargement of TESMA's technical aid to theatres in the United States was another facet of the new TESMA program under discussion. It was pointed out that theatre operating standards to be set up by the Hatch committee would, of necessity, be required to originate largely among TESMA members so that the standards thus set up could be adopted by the International Standards Association and thus be a guide for theatre owners all over the world. These standards, when accepted, would be made available to all American theatres, it was emphasized, with their adoption by American theatres to be urged.

President Davee reported that he had received expressed approval of the TESMA program being undertaken from producers, exhibitors, film laboratories and concessions people.

The Board voted to accept the industry invitation to attend the Eric Johnston Testimonial Dinner, April 10th, and will attend en masse.

TESMA members will be asked to communicate with their president, Davee emphasized, so that the Board of Directors could then more closely represent the thinking of the members in its deliberations.

Those present at the meeting, V. J. Nolan, National Carbon Co.; George Marchev, Gordos Corp.; Richard Kneisley, Kneisley Electric Corp.; Arthur Hatch, Strong Electric Corp.; Don Peterson, Bausch & Lomb Optical Co., and Davee, who is president of Century Projector Corp.

iP

How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise — how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

ELECTRICAL NOISE

270 pages, 6 x 9
105 illustrations
$10.00

By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
8. Noise Measurements and Techniques
9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
11. Noise in Communication Systems

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New Arc Lamp Mirrors From Strong Electric

Production of a new first-surface dichroic mirror for use in projection arc lamps has been announced by The Strong Electric Corporation, Toledo.

These front coated reflectors, which are being marketed under the name of Tufcold are said to afford a longer period of service. The projected light is reflected from the front surface and without passing through the glass twice as with second surface mirrors. Maximum screen illumination is maintained, film buckle is reduced, and focus is improved. There is no emulsion blistering regardless of the power of the arcs.

Tufcold reflectors are said to show far less coating deterioration or pitting by ejections from the arc than second surface reflectors.

iP

Constellation Installations Across the Country Shown In Projection Room Scenes

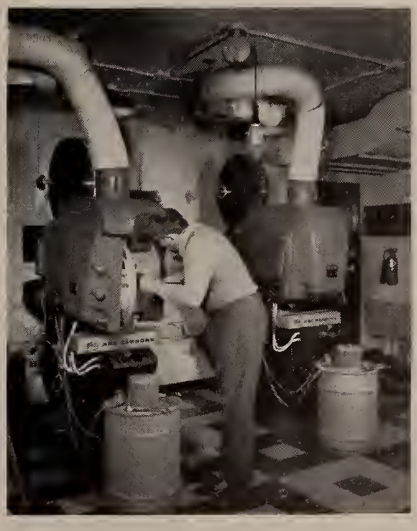


CONSTELLATION INSTALLATIONS — National Theatre Supply has just completed installation of Constellation "170" Projection Arc Lamps in the Boulevard Theatre, Baltimore, Maryland, (above) and the Empire Theatre, Kansas City, Missouri. They will be used on National "70" Bauer Projectors at the Boulevard and Phillips Norelco at the Empire.



CONSTELLATION INSTALLATIONS — National Theatre Supply has just completed installation of Constellation "170" projection arc lamps in the Fox Theatre, St. Louis, Missouri, (above) and the Oasis Drive-In Theatre, Elk Grove Village, Illinois.





K. E. Kanis Elected to Pathe Board

Kurt E. Kanis, general manager of Pathe Laboratories, Inc.'s New York plant, has been elected to the Board of Directors of the company.

Kanis joined Pathe in 1949 when he set up the company's 16mm operation. In 1953 he was made sales manager and in 1959 was appointed general manager. He is a member of SMPTE and Motion Picture Pioneers.

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PROJECTOR CARBONS
Better Light! Lower Costs!
RINGSDORFF CARBON CORP. East McKeesport, Pa.

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From Your Carbons
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Acclaimed by leading technicians in the industry as the most comprehensive and down-to-earth handbook published to date on the subject of motion picture projection. Ideally suited for study and reference by your operators.

ROBERT A. MITCHELL'S

MANUAL OF PRACTICAL PROJECTION

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★ **Here is one of the most helpful works ever published for the motion picture projectionist. A handsomely bound and profusely illustrated compilation of the BEST of the Robert A. Mitchell articles that have appeared in "International Projectionist," revised, brought up to date.**

★ **The author covers clearly and thoroughly every aspect of motion picture projection, presenting his material in easily understood language—not too technical, yet technically accurate. The Manual is divided in 8 sections and contains 30 chapters — a valuable reference work no progressive projectionist should be without.**

SECTION HEADINGS

(1) Film; (2) The Projector; (3) Projection-Optics, Screens; (4) The Arc Lamp; (5) General Projection Practice; (6) Motors, Generators, and Rectifiers; (7) Sound Reproduction Systems; (8) Projection of Color and 3-D Films, Formulas.

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Film Exchange Workers Receive Wage Hike

NEW YORK — Workers at film exchanges in 30 key cities throughout the United States will receive a blanket wage increase of $5.00 per week, retroactive to December 1, 1960, under terms of an agreement just reached by the IATSE and 11 distributing companies.

In addition, company payments into the Film Exchange Employees Pension Fund will be increased by two cents per hour, bringing the total weekly payment for full-time (37½-hour) employees to $3.00.

Fringe benefits include an improved vacation clause, under which workers will get three weeks off with pay after 13 years of service, instead of after 14 years as in the past.

Also provided is a 13th week of severance pay for employers on a company's payroll 24 years or more. The old maximum was 12 weeks after 22 years.

The settlement was reached following more than three months of negotiations, with IATSE President Richard F. Walsh taking part in the final meetings.

The agreement applies to inspectors, shippers, bookers, billers, cashiers, stenographers, typists and clerks employed by MGM, Paramount, 20th Century-Fox, Warner Brothers, United Artists, Universal, Columbia, Allied Artists, Buena Vista, National Screen Service and National Film Service.

iP

Appointments Announced At Kodak Laboratories

ROCHESTER, N.Y. — Seven members of research management have been named to new positions of responsibility in the Kodak Laboratories, it was announced today by Dr. Cyril J. Staud, Eastman Kodak vice-president in charge of research.

Dr. John A. Leermakers has been named associate director of the research laboratories. He has been assistant director since 1947.

Two new assistant directors have been appointed. They are Dr. Rudolph E. Damschroder and Dr. Wesley T. Hanson, Jr.

Dr. Robert E. Stauffer has been named head of the emulsion research division, succeeding Dr. Damschroder. Dr. Douglas E. Piper has been appointed associate division head in emulsion research.

Dr. Paul W. Vittum has been named head of the color photography division, succeeding Dr. Hanson. Dr. Arnold Weissberger has become associate division head.

The appointees, who are all widely known in their respective fields, all began their new duties on February 20. The research laboratories employ more than a thousand persons in basic and applied research activities related to photography and other aspects of Kodak business.

iP

New Manual

An extremely comprehensive compilation of motion-picture data is contained in the first edition of the American Cinematographer Manual.

The publishers describe the contents of the volume "complete shooting data for the theatrical, television, industrial, military, educational and documentary cinematographer, filming 65mm, 35-mm, 16mm, anamorphic or spherical motion pictures in any aspect ratio, in color or black and white, silent or sync-sound, high or low camera speed, in the studio or on location, in the Arctic or in the tropics!"

The text includes data on panning speeds, optical effects, ultra high speed underwater cinematography, shooting background plates, shooting process scenes, traveling mattes, shooting day-for-night in color and black-and-white, picture and sound synchronizing methods, sound recording, artificial lighting, and color.

iP

L. F. Granger Named Advertising Manager for National Carbon Company

NEW YORK, N.Y. — Laurence F. Granger has been named advertising manager for National Carbon Company, Division of Union Carbide Corporation.



Granger has been active in advertising and public relations work with Union Carbide for the past 23 years, and most recently was associated with Union Carbide Metals Company.

BOOKS ON ELECTRONICS . . . WORLD FAMOUS FOR TECHNICAL EXCELLENCE

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Learn the "picture-book" way!

You can master the basics of electricity, electronics or television with these easy "learn-by-pictures" courses. Hundreds of bold, dramatic, informative, specially prepared illustrations make ideas easy to understand. There is one idea to a page with at least one big illustration to make the text crystal-clear. Step-by-step explanations let you learn as slowly or as quickly as you like. Study at home . . . no teachers . . . no correspondence. It's the easiest way to learn the fundamentals of electricity, electronics and television.

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2. BASIC ELECTRONICS

Soft Covers, 5 volumes, 550 pp., Only $10.00 per set
both by Van Valkenburgh, Nooger, Neville, Inc.

3. BASIC TELEVISION

by Alexander Schure, Ph.D., Ed.D. Soft Covers, 5 volumes, 688 pp., Only $10.00 per set

4. HOW TO READ SCHEMATIC DIAGRAMS

by David Mark covers the symbols and abbreviations used in schematic diagrams related to the electronics field. Starts with individual components and carries through to complete receivers and similar equipment. Components and circuits are not only identified, but also explained—making this a short course in electronics. Soft Cover, 160 pp., illus., Only $3.50

5. HOW TO USE METERS

by John F. Rider explains in detail the construction and operation of all types of electrical meters. Gives the details of what kind of meter to use for making different kinds of measurement and tells you where to connect the meters. Soft Cover, 144 pp., illus., Only $3.50

6. STEREOPHONIC SOUND

by Norman H. Crowhurst can save you hundreds of dollars by guiding you to the choice of the right stereophonic equipment for home use. Covering all the main systems, this book explains theory and tells you how to get the most listening pleasure from the various systems. It guides you in selecting loudspeakers and other components. Also, it discusses stereo systems and techniques used for motion pictures. Soft Cover, 128 pp., illus., Only $2.25

7. BASIC PHYSICS

by Alexander Efron, E.E., Ph.D., makes physics self-teachable. A unique classroom-tested "spiral" approach, mature analystical explanations, clear illustrations and other learning aids make it possible for you to master this intermediate-level physics course through home study. This course is modern, rigorous, complete and balanced. It covers everything from the contributions of early Greek philosophers to satellites. Questions and problems let you test yourself as you go along. Mastery of BASIC tion you need for advanced technical PHYSICS gives you the firm foundastudies. Cloth Bound, 2 vols. in single binding, 724 pp., illus. Only $7.60

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Mirrors

. . . Continued from Page 9

Front-surface interference-type reflectors, such as the Strong TufCold, must never be cleaned with scouring powder or steel wool, as these abrasives might injure the moicroscopically thin optical coating. Fortunately, this modern type of mirror is relatively free from scumming and pitting. Dust should be wiped from "cold" mirrors with a soft cloth, and stains and fingerprints removed by means of a soft cloth moistened with lens-cleaning fluid.

Always keep a spare Strong replacement reflector on hand to avoid shutting down the show or attempting to run on only one projector in the event of accidental mirror breakage. As a matter of fact, the purchase of two spare mirrors is the best policy, inasmuch as periodic replacement on the reflectors is the best way to maintain top-quality projection at all times- — a wise investment in better theatre business.

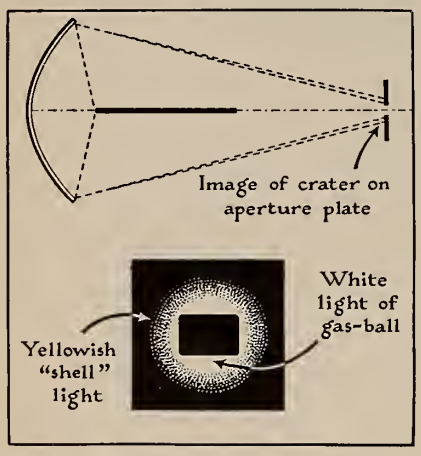


FIG. 7 — The "spot" is a magnified image of the intensely brilliant positive crater formed on or near the film aperture of the projector by the optical action of the arc-lamp reflector. The actual image of the crater is moved beyond the aperture toward the projection lens in 70-mm projection to insure adequate coverage of the large aperture with light.

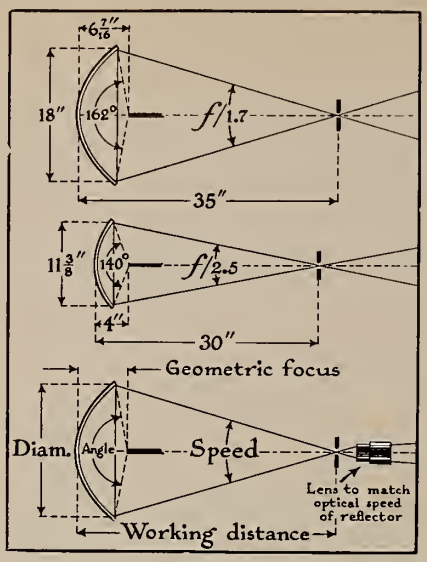


FIG. 8 — Large reflectors usually have a "faster" optical speed then small reflectors, and hence provide more light to the picture. The distance of the positive crater to the mirror determines the light-collecting angle and the magnification of the crater image on or near the film aperture.

When replacing reflectors in the lamphouses, avoid tightening the mirror-holder clamps excessively. Tighten the clamps to a degree, but give the mirrors freedom to expand and contract with the variations in temperature, thus preventing breakage caused by sudden heating or by drafts of air which may rapidly chill the glass when the lamphouse door is opened.

iP

WILLIAM HASSETT DIES

William Hassett passed away in San Diego, California on January 10. Services and interment were held in San Diego. Mr. Hassett was a member of the Chicago Moving Picture Machine Operator's Union, Local 110.

Whitebone Re-elected to New Brunswick Post

James A. Whitebone, secretary and business agent of IATSE Local 440, St. John, N.B., has been re-elected president of the New Brunswick Federation of Labor after being out of that office for a year. He succeeds Angus MacLeod, who defeated him in 1959 but was not a candidate for a second term. Whitebone is now serving his 28th term.

Whitebone is also the first Labor Mayor of Saint John, after service on the City Council during most of the years since 1936. He moved into this office following the death of Mayor D. L. Maclaren. He has been an IATSE member since 1919 and a Local officer since 1922.

iP

NTS MOVES

National Theatre Supply Company has moved. As of March 1, the new address of their general office is 50 Prospect Ave., Tarrytown, New York.

INTERNATIONAL PROJECTIONIST

Post Office Box 6174
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Enter my subscription for ( ) 1 year (12) issues—$3.00
( ) 2 years (24) issues—$5.00

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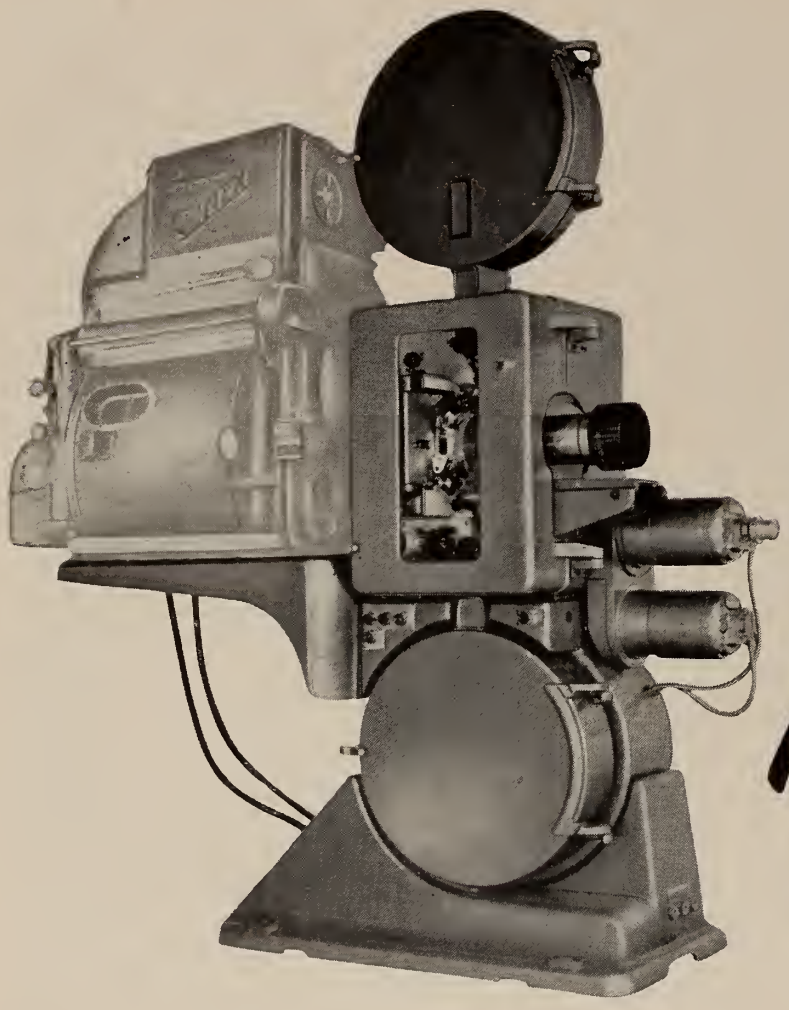
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a few facts for projectionists about the

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Serving Science and Industry

UNIVERSAL 70/35mm PROJECTORS

Projectionists who have been operating Norelco Universal 70/35mm projectors (over 200 theatres already have them!) are unanimous in their reports that it's a smooth running, reliable mechanism. The big difference is that the Norelco 70/35 was designed from the ground up specifically for 70mm/35mm projection. It is not an adaptation of a 35mm machine. Conversions from 70mm to 35mm take less than 4 minutes and runs as high as 1500 per print are being reported by theatres!

The following check list will help you become familiar with a few of the outstanding features of the Norelco Universal 70/35 Projector:

• Fully compatible with, and quickly convertible for: 70mm or 65mm film with up to six magnetic sound tracks; 35mm CinemaScope with four magnetic or single optical sound tracks, and Perspecta-Sound, Wide Screen film of any aspect ratio with either magnetic or optical sound and standard 35mm film. • Scientifically compounded curve of light gate—prevents film buckle. • Single blade, double speed conical shutter, providing highest light transmission of any projector. Leading and trailing edges have integral air scoops that aid in dissipating heat. • Rollers, drums, sprockets and film gate made from non-magnetic materials—eliminates possibility of magnetic sound track damage and necessity for frequent degaussing. Dual sprockets on all shafts machined of hardened aluminum alloy. No sprocket change required when changing from 70mm to 35mm or vice versa. (Less than 4 minutes required.) • Two independent motors on each projector, 24 and 30 fps—all past, present or contemplated 70mm films can be projected without additional expense or modification. • Combination ten-track magnetic clusters, no tricky threading required when changing from six- to four-track reproduction. • Triple filtered metered lubrication system. • Substantially constructed for rock steady projection. • All modern domestic high-power arc lamps adaptable without loss of efficiency. • Lathe bed lens carriage, positive alignment of lens to film path. • Factory installed internal wiring, reduces installation costs. • Adjustable for all projection angles—from 28 degrees downward to the upward angles required in drive-ins. • Complete stock of replacement parts always available. • Full Underwriters' Laboratories Approved.

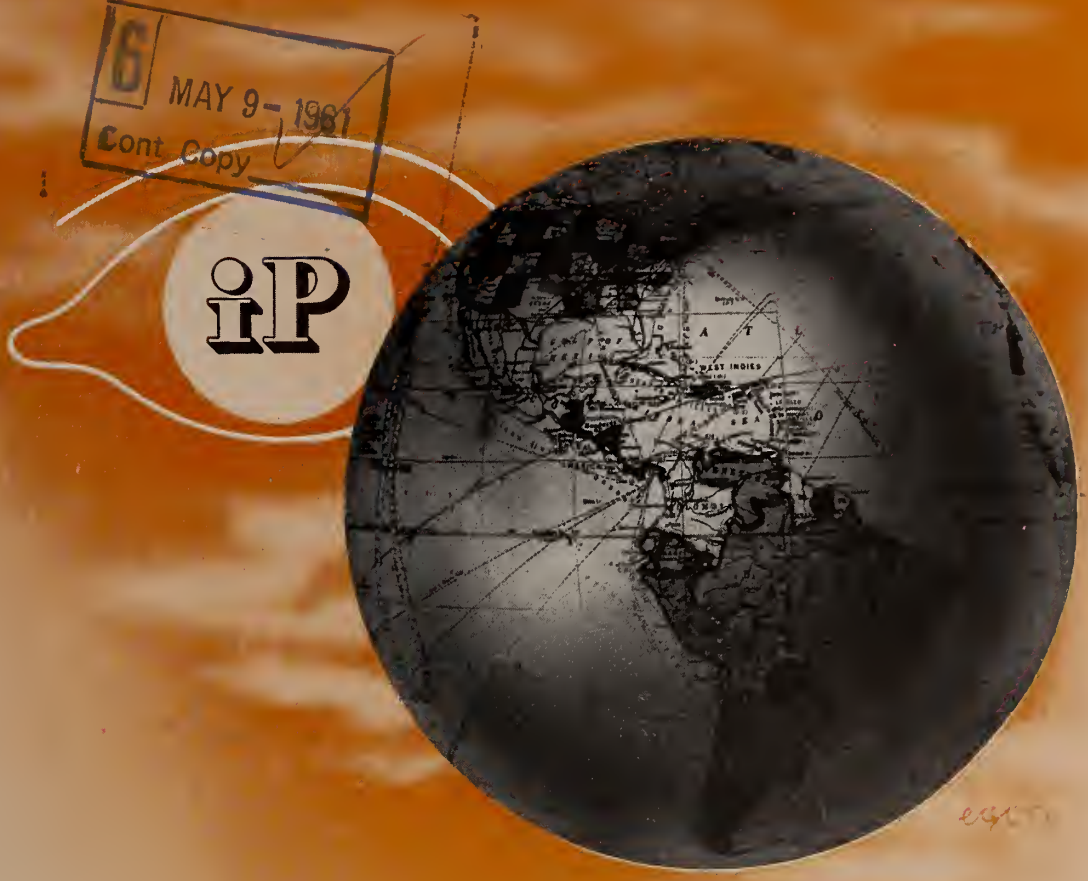
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PROJECTIONIST

INTERNATIONAL

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APRIL 1961

VOLUME 36 NUMBER 4

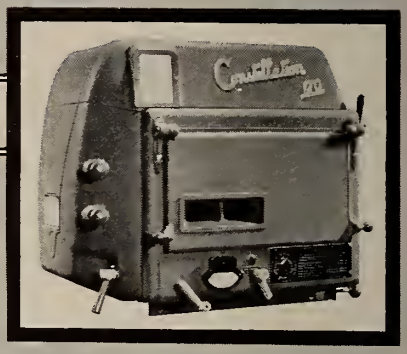
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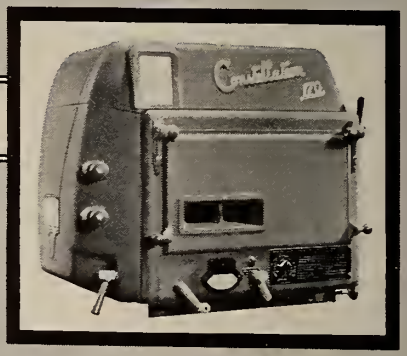
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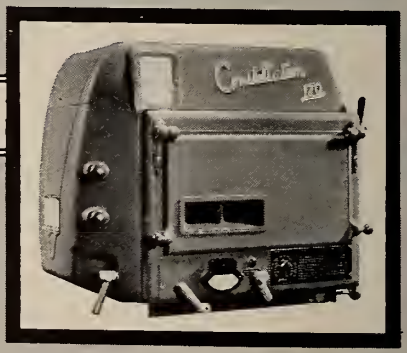
COOLER-CLEANER

A complete change of air 12 times a minute. Prevents smoke and soot from settling on the mirror. 30 degrees cooler than other high powered lamps. The cold type reflector is cooled by twice as much air as used in other lamps. Uses existing exhaust systems which work efficiently with arcs operating at 90 amperes or above.



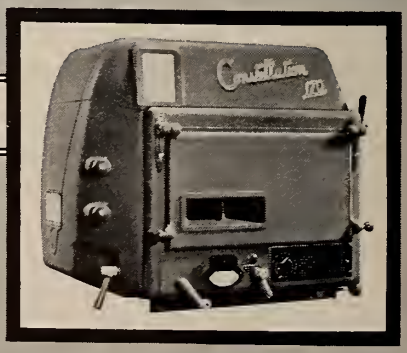
TROUBLE-FREE

Heavy duty pure silver carbon contacts. Fully enclosed single-piece water conducting tube for each contact. No water connections, no flexible conduit, no welded or clamped joints to break or leak at the contact.



MORE EFFICIENT

The spot is shaped to the dimensions of the aperture, eliminating the light waste of round spots. Accommodates full 20-inch 13.6 mm positive to project a double 35 or 70 mm reel more than lamps which cannot burn this length. The single adjustment feed control can be set to burn the desired number of inches of carbon per hour, from 7 to 22, by means of separate geared head motors.



MORE CONVENIENT

Integrated arc control system automatically maintains a uniform gap length with the crater accurately held at the focal point of the reflector, to maintain a screen light of constant intensity and color. Rear door permits easy retrimming, and cleaning of the reflector. Easy installation in low ceiling rooms.

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INTERNATIONAL
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Including a special Audio-Visual section relating to the operation and maintenance of A-V equipment in the educational and industrial fields.

Volume 36 **April 1961** **No. 4**

EAST COAST OFFICE
545 Fifth Avenue
New York 17, N. Y.
Murroy Hill 7-7746

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Generol Monoger
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MIDWEST OFFICE
1645 Hennepin Avenue
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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

GETTING READY FOR THE SEASON

This is the time of year in many sections of the country when additional projectionists are hired to operate the drive-in theatres which now constitute a large portion of the motion picture theatres in the country. The employment is badly needed and a very welcome thing, although in some states the question of "summer theatres" is largely an academic one since the operating season for these theatres is getting longer and longer.

Although drive-in theatres are permanent in the sense that the projection room is not dismantled, the projection equipment may be carried away for storage in some installations and certainly the exterior equipment — the sound lines and speaker cables need considerable amounts of maintenance. In the northern areas this exterior maintenance is the single most important problem since often entire lines of speaker cable have to be replaced, the speakers themselves may have been damaged by weather and the replacements are always necessary because the winter season is the time for testing and evaluating whether new equipment is used or not. The projectionist owes it to himself and to the quality of his projection to convince his exhibitor that ample time must be allowed for lining up the projection and the sound equipment prior to opening, replacing worn or broken equipment, and in general seeing that the entire installation will be ready to provide many months of trouble free use. This will please the exhibitor because his customers will be pleased; it certainly should please the projectionist because he will not be as subject to the constant little irritations caused by faulty equipment.

Remember the phrase "Proper prior planning prevents poor performance." Many projectionists who got their training — or at least an interest in projection equipment — in the service remember that there was another word in that sentence designed to push the point home.

Remember that a systematic step-by-step servicing plan is helpful and it is only by exercising extreme care in this plan that the projectionist can be sure all units have been covered thoroughly and the show will run smoothly.

The inspecting and servicing plans will include preliminary cleaning, cleaning drives and gears, checking the intermittent, checking the film course, the upper magazine, the lower magazine and takeup assembly, complete lubrication and checking the safety shutter.

Next in importance is the motor check, the film-flow test, the checking of projection lenses, the lamp and ventilating system and the lamp electrical appliances — the carbon holders.

Lamp optics should be considered, you should check the generators or rectifiers; of course a light check and a check of the screen is necessary.

Finally comes the picture test using a good quality print and perhaps even contributing an hour or two to running this picture under actual night time operating conditions prior to the opening of the theatre.

By doing this inspection, the projectionist will have satisfied the demands of his craft, have done a good job for his employer that should leave a warm feeling throughout the year, and most important of all will make it possible for the consumer to enjoy the show and come back again.

INTERNATIONAL PROJECTIONIST

Volume 36 April 1961 Number 4

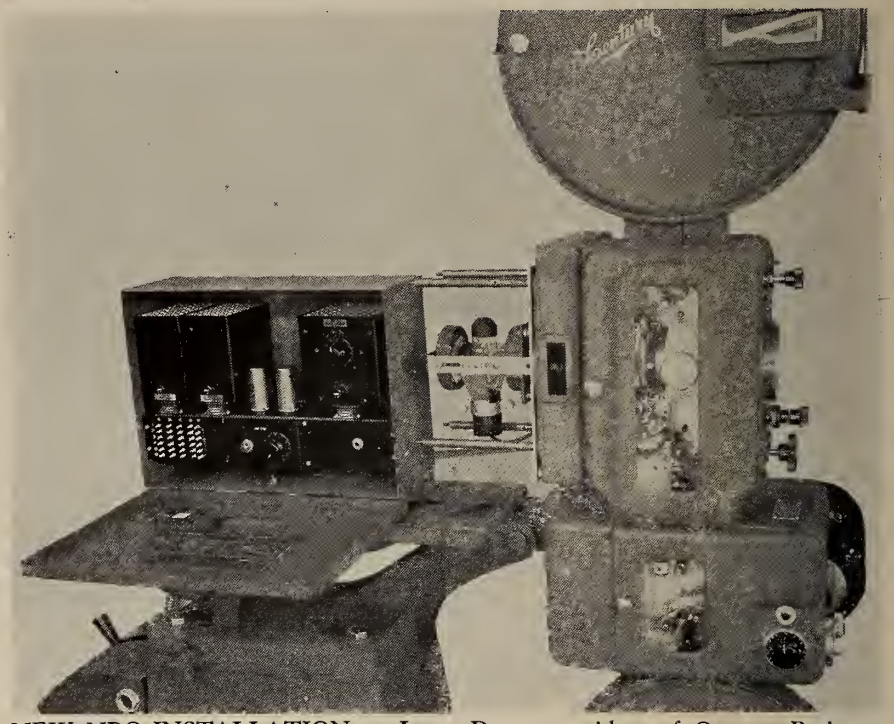
"Shadows" Director Denies Anti-Union Charge

NEW YORK — John Cassavetes, director of Lion International's release of "Shadows" took a full page ad in the Film Daily recently to answer a statement by Eugene Archer of the N. Y. Times that the film was one of the few locally made features to obtain commercial release without cooperation of Union technicians.

Cassavetes clarifies his stand in the ad, which reads: "Let me say that 'Shadows' was made without any anti-Union motives. I deeply deplore and oppose any suggestion that non-Union or anti-Union production methods or procedures are necessary for the production of successful motion pictures. Being a member of several unions, including the Screen Actors Guild and the Screen Directors Guild, I of course would not at any time intentionally do anything which would be harmful to IATSE or any other Union or Guild."

"Shadows" was originally shot as an exercise for a N. Y. actors group.

iP



NEW NBC INSTALLATION — Larry Davee, president of Century Projector Corp., has announced the sale of three Century projector and transistor sound systems to the National Broadcasting Co. for its screening rooms at Rockefeller Center. The systems are being installed by Capitol Motion Picture Supply Co. of New York. The Century transistor sound system is shown above mounted on a Century pedestal with Century Model H projector mechanism and sound reproducer with a special studio incandescent lamp unit.

Motion Picture Academy Announces Scientific and Technical Awards

The scientific or technical achievement awards presented anually by the Academy of Motion Picture Arts and Sciences were announced today (Friday, April 7) by Valentine Davies, Academy president.

The awards were voted by the Academy Board of Governors from recommendations made by the Scientific or night, April 17.

They will be presented on "Oscar" Technical Awards Committee.

A plaque signifying Class II award will be presented to:

● Ampex Professional Products Company for the production of a well-engineered multi-purpose sound system combining high standards of quality with convenience of control, dependable operation and simplified emergency provisions. This system provides facilities for reproducing optical and stereophonic magnetic sound tracks from either 35mm or 70mm film. The complex circuits necessary for this multi-purpose unit are controlled by push-button selectors, making the system extremely simple and convenient to operate.)

Certificates signifying honorable mention for Class III awards will go to:

● Arthur Holcomb, Petro Vlahos, and the Columbia Studios Camera Department for a camera flicker indicating device. Flicker has always been a serious camera problem. In most cases a flicker situation is not known until the material is processed and screened, and it can be annoying and costly if retakes are necessary. This device provides the cameraman with a visual of detecting the camera malfunctions which produce screen flicker.)

● Anthony Paglia and the 20th Century-Fox Studios Mechanical Effects Department for the design and construction of a miniature flak gun and ammunition. (This hand-actuated gun fires timed ammunition which realistically and economically simulates flak for special effects photography.)

● Carl Hauge, Robert Grubel and Edward Reichard of Consolidated Film Industries for the development of an automatic developer replenisher system. (Using an infra-red scanning unit with monitoring controls, this device continuously and automatically introduces replenisher to the developing solution at the time and rate required for precision chemical control in the processing of motion picture film.)

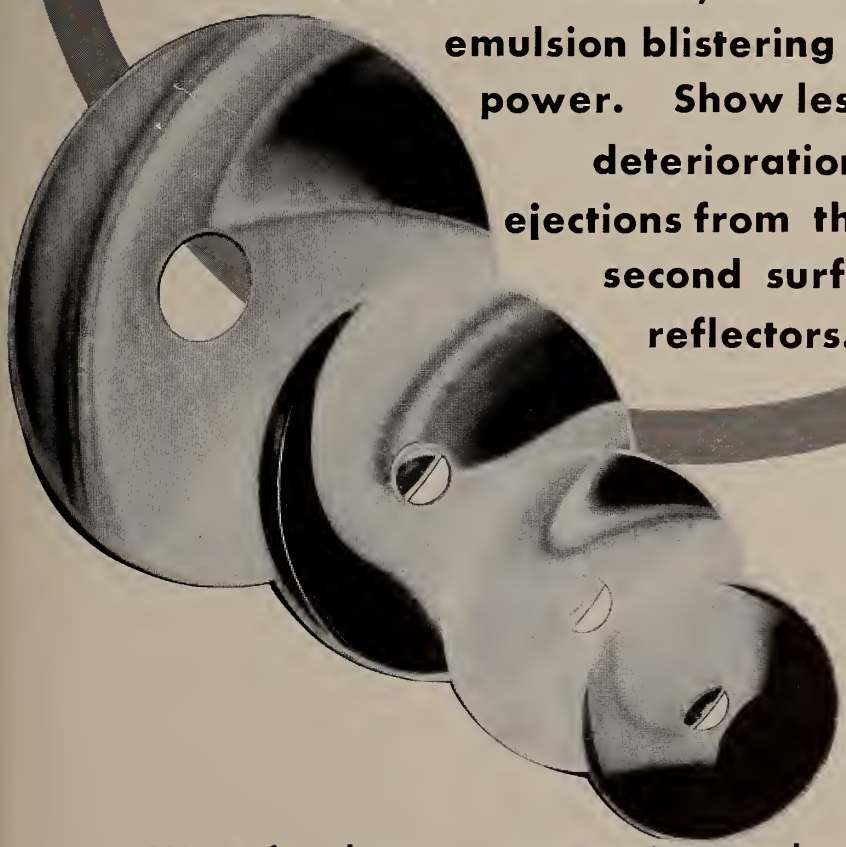
The Academy Board of Governors expressed its appreciation to each member of the Scientific or Technical Awards Committee, and Subcommittees making the recommendations, for their assistance in this year's consideration of entries. **iP**

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FIRST SURFACE
(Front Coated)
TUFCOLD
DICHROIC MIRRORS

New Long-Service
Reflectors for
Reducing Light Loss

Projected light is reflected from the front surface and without passing through the glass twice as with second surface mirrors. They maintain maximum screen illumination, reduce film buckle, and improve focus. No emulsion blistering regardless of arc power. Show less coating deterioration or pitting by ejections from the arc than second surface reflectors.



New reflectors afford the lowest cost way to picture brightness.

How long since you last replaced yours? You should do so regularly.

Write for data on correct sizes and type for your lamps.

THE STRONG ELECTRIC CORPORATION
31 CITY PARK AVENUE • TOLEDO 1, OHIO
Manufacturers of Reflectors for 25 years

FRONT - SURFACE 'COLD' MIRRORS FOR HIGHER EFFICIENCY, GREATER ECONOMY

• Projection on big screens requires carbon arcs so powerful that the film may buckle out of focus, or actually blister, when ordinary reflectors are used in the lamps. But by replacing silvered mirrors with "cold" reflectors, picture-blurring, film-damaging heat becomes a thing of the past. Veritable miracles of efficiency and economy in motion-picture projection are made possible by the Strong TufCold, which brings the exclusive advantages of front-surface "cold" reflectors to every user of rotating-positive reflector lamps.

NOT ONLY are the movies better than ever — they are also bigger, brighter, and more realistic, thanks to the tremendous light-producing power of modern projection lamps! But unfortunately, the inception of panoramic widescreen processes and the gradual raising of indoor-theatre screen-brightness levels from the old minimum level of 10 foot lamberts to an average of 20½ foot lamberts (measured with the projector shutter running) have increased the heat problem to serious proportions.

The average American indoor screen is about 35 ft. wide, and, of course, many are over 45 ft. wide. The average drive-in screen is more than 90 ft. wide, and many exceed 110 ft. Now, the many thousands of lumens of light needed to illuminate these enormous screens must be squeezed through the film aperture of the projector — a tiny "window" which, in 35-mm projection, is even smaller than a postage stamp!

The delicate film may be disastrously overheated by the fierce blaze of concentrated radiation. The individual frames of film are exposed to the intense heat for only a fraction of a second; but during this short time they flutter in and out of focus so rapidly, and often so violently, that the picture is blurred. The projectionist cannot possibly adjust the lens for a clear picture when the film buckles. In extreme cases, the emulsion of the film is actually blistered, and the print completely ruined in one showing.

Cold Mirror a Dream Come True

The most practical solution of the heat problem is an arc-lamp mirror which reflects to the film and screen all of the light emitted by the crater of the positive carbon while permitting the useless, invisible, heat-generating radiations — the ultraviolet and infrared rays — to pass right through the mirror and into the rear of the lamphouse where their heat is dissipated by ventilation.

Reflectors which act selectively upon the mixed radiations of the carbon arc so as to focus only the useful visible rays upon the film aperture, rejecting all others, are now available to every user of rotating-positive reflector lamps in greatly improved form — the Strong TufCold front-surface "interference" mirror.

The advantages offered by TufCold arc-lamp reflectors are impressive. They almost completely eliminate the likelihood of film damage, they reduce buckle for clearer, steadier, more lifelike pictures on the screen, they increase the brightness of the pictures by eliminating light-robbing heat filters, and they save money on mirror replacements by resisting scumming and pitting to a marked degree.

The heat problem, now relegated to theatres not yet equipped with Strong TufCold reflectors, has two distinct aspects which must be separately evaluated by the purchasers of projection equipment and by the projectionists who operate it.

Older Methods Inadequate

The more urgent aspect of the heat problem is the print-damaging, buckle-producing effect of direct irradiation of the film by the concentrated rays of the arc lamp. In the days before the introduction of TufCold reflectors, this heating effect was mitigated by interposing heat filters in the light beam between the lamp and the projector mechanism. And even though heat filters have been improved since the days of the now obsolete infrared-absorbing glass, the use of heat filters has many disadvantages.

Notwithstanding their relatively high efficiency, interference-type heat filters waste an excessive amount of light, namely, from 10% to 15% when the filters are new, and from 15% to 20% after they have been in use for



Interference coatings are deposited on reflectors in a 60 inch vacuum chamber under rigid instrument control and with constant monitoring by technicians.



Individual finished reflectors are checked for light reflecting and heat transmitting qualities as well as for beauty in appearance.

some time. They reduce aperture heat to about 55% of its original value when an ordinary silvered reflector is used in the lamp, but it should be remembered that some of the heat elimination is the result of eliminated, and thereby wasted, light.

Interference filters do their work by transmitting the useful light (about 85% of it, on the average) and reflecting most of the hot, useless infrared rays back into the lamphouse. Interference filters do not themselves get as hot as absorption-type filters, and accordingly do not require such energetic refrigeration to prevent their destruction. Nevertheless, the microscopically thin layers with which they are coated gradually deteriorate in the reflected arc beam, and may burn off quite suddenly, with cracking of the glass, if the beam is accidentally concentrated to a focus upon them.

Another method of reducing the temperature of the directly irradiated film is the use of an air-jet at the projector aperture. This method does not prevent heat from being generated in the film by absorbed radiation, but it does help to remove it before the temperature rises high enough to scorch the emulsion. Because it is likely to aggravate the fluttery in-and-out-of-focus movements of the film, air-cooling is not generally desirable except in the few unusual cases where it must be used as a last resort.

Big Arcs Require TufCold Mirrors

The Strong TufCold interference-type reflector has made the use of heat filters and air-cooled film gates unnecessary even when such powerful modern lamps as the Strong Mighty-90, Super-135, U-H-I, and 35/70 Special, among others, are employed for the realistic, daylight-bright widescreen projection increasingly demanded by the moviegoing public.

On the whole, projection engineers feel that simplified high-intensity ("Suprex") lamps fitted with ordinary silvered mirrors do not require the use of heat filters when operated at arc currents below 75 or 80 amperes. The radiant-energy flux at the center of the 35mm film aperture ranges from 0.7 to 0.8 of a watt per square millimeter at these currents with this type of arc lamp. On the other hand, some method of reducing heat must be used with all rotating-positive high-intensity lamps, inasmuch as these lamps have large mirrors (16", 16½", and 18") and burn from 75 to 180 amps. (0.8 to 1.2 W/mm^2).

The effect of the Strong TufCold reflector in reducing aperture heat — the heat on the film due to direct irradiation — is almost magical! Even though delivering substantially more light to the screen than a silvered mirror used in conjunction with a heat filter, the TufCold reduces heat at the center of the aperture to 0.4 or 0.5 W/mm^2 with rotating-postive reflector lamps at high arc currents, and results in a center-aperture flux of only 0.6 to 0.7 with the most powerful projection lamps in existence, the Strong Jetarc and the National Ventarc, each

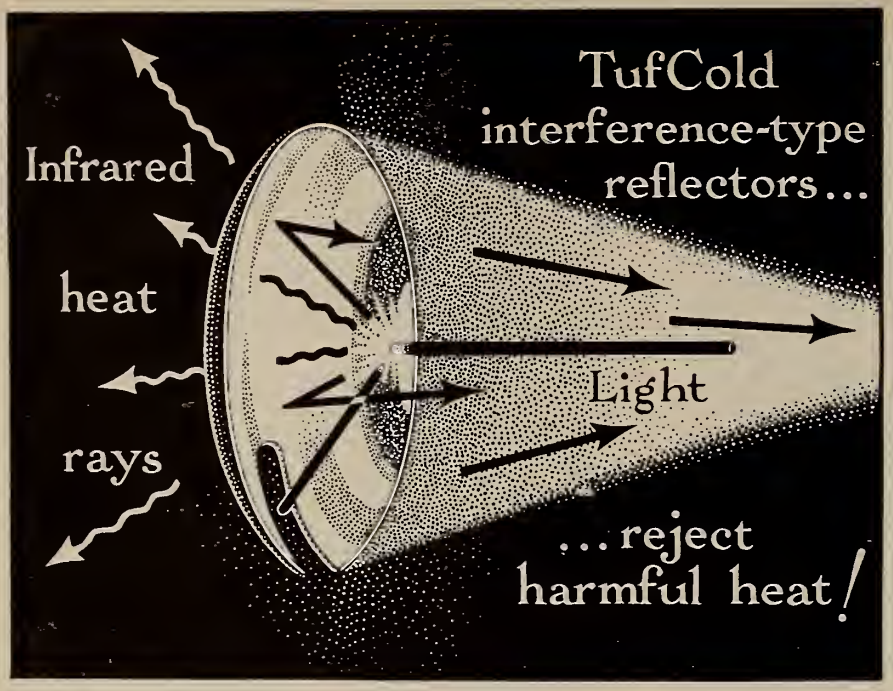
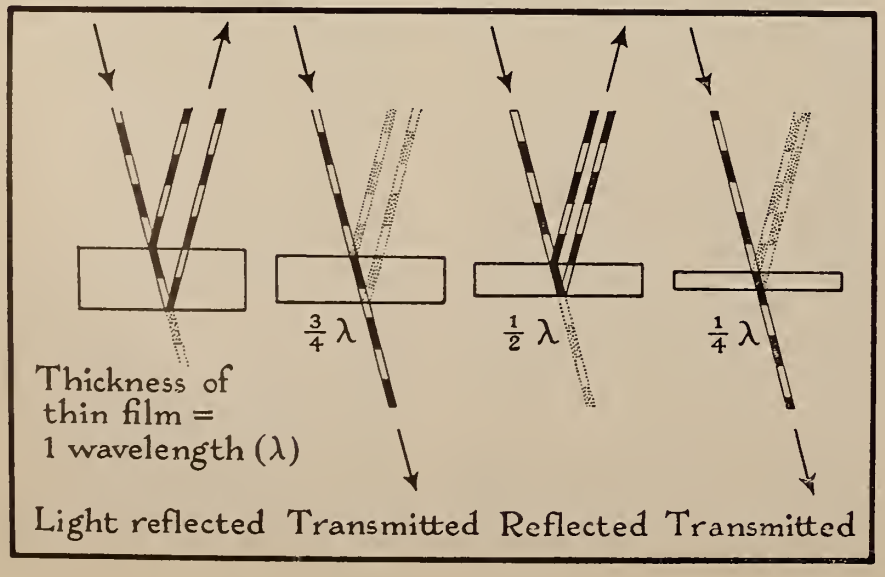


FIG. 1 — An interference-type reflector reduces heating of the film and mechanism by reflecting only the useful light rays to the projector aperture. Invisible heat-producing infrared rays pass right through the mirror and into the rear of the lamphouse, where they are dissipated harmlessly.

FIG. 2 — When a ray of light falls upon a thin transparent film equal in thickness to the length of the light waves, or ½ this length, the waves are reinforced and totally reflected. On the other hand, if the thickness of the film is equal to ¾ or ¼ the wavelength, "cancellation" of the reflected waves results in total transmission. These phenomena are known as "interference."



of which has a 21-inch reflector! These values of radiant flux are actually in the same heat range as those obtained with small and medium-size Suprex lamps having silvered mirrors.

The second aspect of the heat problem concerns the conduction of large amounts of heat from the metal rails and tension shoes of the film gate to the perforation margins of the film. Thermal conduction is very deleterious to the film, causing it to warp, shrink, and become brittle. It is prevented by using water-cooled gates in the projectors — an absolute necessity in the operation of many drive-ins and other large theatres. Use of Strong TufCold reflectors in the arc lamps eliminates the need for water-cooled gates in many instances, however, by drastically reducing the heat content of the radiation focused upon the aperture plate of the projector mechanism.

Heat of Arc Radiations

An ordinary silvered mirror reflects all of the radiations of the high-intensity carbon arc — ultraviolet, visible, and infrared — about equally well. The ultraviolet wavelengths in high-intensity arc radiation extend from 3250 Angstroms down to 4000 Angstroms and account for 4% of the radiant energy emitted by the arc. The region of visible radiation — light — extends from 4000 Angstroms (violet) through all the colors of the spectrum down to 7500 Angstroms (deep red), accounting for 40% of the energy. The Infrared wavelengths, which account for the remaining 56%, extend from 7500 Angstroms down to about 40000 Angstroms (but are actually rather weak beyond 20000 Angstroms).

It is obvious that complete removal of the invisible ultraviolet and infrared wavelengths from the arc radiation will reduce the heat to only 40% of its original intensity. That is, the visible light, alone, accounts for 40% of the total heating effect of high-intensity arc radiation.

Cold Mirror Best Heat Reducer

No actual heat filter or cold mirror is quite as perfect a remover of ultraviolet and infrared as this theoretical ideal; **but of all the means known for reducing the heat content of arc radiation, the interference-type cold reflector is by far the most effective, as tests amply prove.**

Suppose a silvered-glass reflector be used in an arc lamp, and the relative intensities of screen light and aperture heat obtained each be asigned a numerical value of 100%. On this basis, the insertion of an absorption-type

heat filter in the arc beam will reduce the light to a value of about 80%, and the aperture heat to about 60% of its original value.

Is this a 40% reduction in the heat? Not really. In order to maintain the former level of screen illumination, the total amount of radiation must be increased by raising the arc amperage. Lumen for lumen of light, therefore, the absorption filter reduces aperture heat to about 60/80 = 75% of its original value — a heat reduction of only 25%!

Interference-type heat filters fare somewhat better: Light = 85% of original value, heat = 55% of original value, lumen-for-lumen heat value = 55/80 = 65%, a 35% heat reflection.

Strong TufCold reflectors reduce the heat without reducing the light at all, and hence enjoy a tremendous advantage over heat filters of all types. As a matter of fact, tests reveal that TufCold mirrors are actually better reflectors than silvered mirrors, resulting in relative lighting efficiencies of 102% — 104%.

On the basis of 103% for the illumination efficiency of a TufCold reflector relative to a silvered mirror, aperture heat is approximately 56% of what it would be with a silvered mirror under the same conditions of carbon trim and current. How much does the TufCold reflector reduce heat on a lumen-for-lumen basis? 56/102 = 54%, a heat reduction of 46%. The heat on the film and aperture plate of the projector is approximately halved by the TufCold, and without loss of light!

"Interference" the Secret of TufCold

The remarkably high efficiency of Strong TufCold reflectors is due to the scientific application of the familiar phenomenon of light-wave interference. A microscopically thin transparent film of relatively high refractive index reflects waves of radiation having a length twice the thickness of the film, and transmits waves whose length is four times the thickness of the film. For most "quarter-wave" and "half-wave" films, the reflection or transmission, as the case may be, is total. The beautiful colors exhibited by a soap bubble and by an oil-slick on water are due to interference.

A cold mirror is made by depositing a large number of thin layers alternately of high and low refractive index upon a highly polished glass mirror blank by thermo-evaporation in a vacuum. The substances used are selected for transparency, refractive index, high melting point, hardness, and chemical stability; and the thickness and uniformity of the layers are meticulously controlled.

The completed cold mirror accordingly consists of a glass blank upon one surface of which is coated a "dielectric stack" comprising a large number of quarter-wave and half-wave interference films. Such an arc-lamp mirror, scientifically designed and manufactured under exacting laboratory conditions, reflects to the projector aperture only the picture-forming visible wavelengths of light while allowing the invisible ultraviolet and infrared rays to pass through harmlessly to the rear of the lamphouse. No visible radiation passes through a cold mirror except an insignificant residual of pinkish light consisting mostly of extreme violet and red rays.

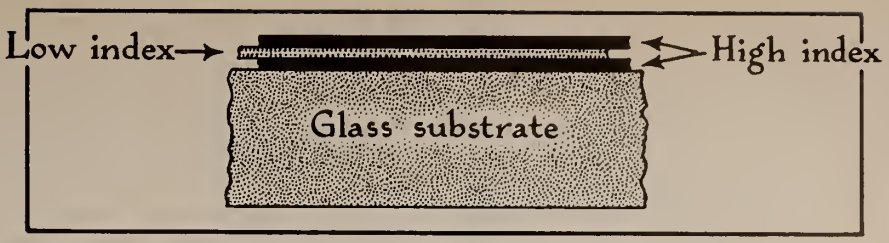


FIG. 3 — A cold reflector is made by depositing a series of thin alternate layers of high and low refractive index upon the surface of the glass mirror blank by a special vacuum process. As many as 9, 11, or 13 layers, both of quarter and half-wave thickness for specified wavelengths, may be used.

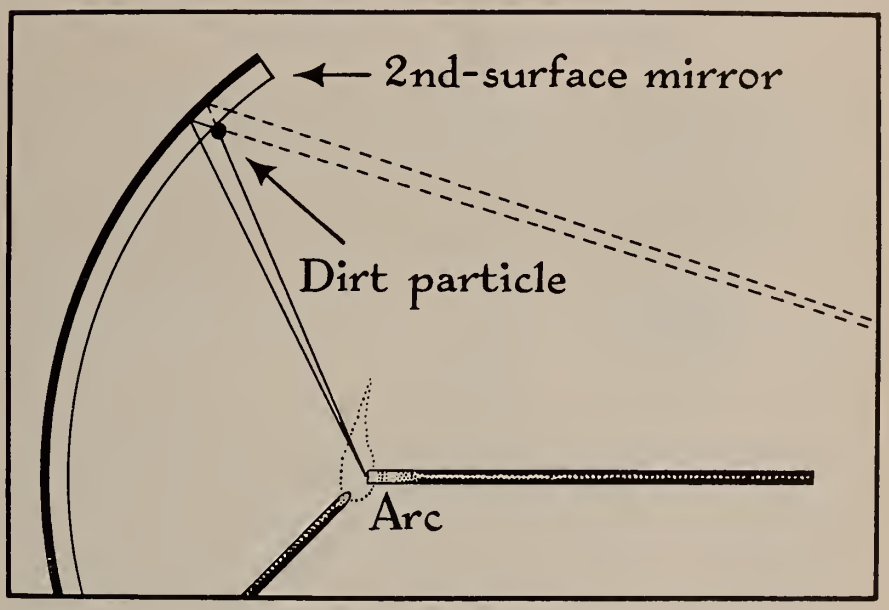


FIG. 4 — How a single particle of dirt on the glass surface of a rear-surface mirror produces the light-obscuring effect of two particles. Strong TufCold reflectors have the reflecting coating on the concave front surface, and hence are free from this "doubling" effect.

Front-Surface Mirrors Superior

Cold mirrors sometimes have the interference coating on the rear surface of the glass. These, like ordinary silvered mirrors, require the light to pass through the glass twice — once on its way from the arc to the reflecting surface, and again as it leaves the reflecting surface on its way to the film aperture of the projector. This twofold passage occasions a small loss of light and also heats the mirror. Rear-surface cold reflectors are equally as subject to pitting and scumming by materials ejected from the arc as silvered mirrors are; and they have other disadvantages.

Unlike the cold mirrors available heretofore, Strong TufCold reflectors are exclusively of the improved front-surface type. The special interference coating on the concave front surface of the glass is remarkably stable and long-lived and resists the formation of white scum and the "burning-in" of copper splashes and carbon particles. The light does not enter the glass of a TufCold reflector — the mirror remains cooler at all times, and special heat-resistant glasses which may be faintly colored can be used for extra insurance against accidental breakage.

TufCold front-surface reflectors are also superior from an optical point of view. They reflect several percent more light, and the presence of dirt particles

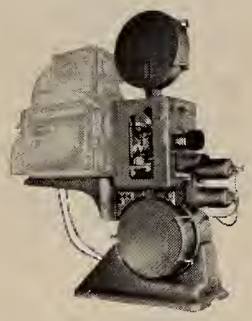
(Continued on Page 18)

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Features of 89th SMPTE Convention:

Super Technirama 70 Process, Czech Motion Pictures

NEW YORK, N. Y. — A session on cinematography, which will feature a demonstration of the Super Technirama 70 Process, will open the 89th Convention of the Society of Motion Picture and Television Engineers, according to Rodger J. Ross of the Canadian Broadcasting Corporation. Ross is program chairman of the five-day convention scheduled for May 7-12 at the King Edward Sheraton Hotel in Toronto, Canada.

Donald Nicholson of the Technicolor Corporation, Hollywood, will lead off this first technical session of the convention at 9:30 a.m. on May 8th, with a description and illustration of the Super Technirama 70 Process. This session will be held at the Tivoli Theatre in Toronto.

According to Mr. Nicholson, the combination of a large-area negative and large-area positive produces a screen result of outstanding quality. In addition, excellent prints may be made in a variety of aspect ratios on 35mm and 16mm print films. The flexibility, he says, is designed to meet today's exhibition requirements.

John R. Gregory, Boeing Airplane Co., Vashon, Washington, will discuss "Some Psychological Aspects of Motion-Picture Montage," in this session.

According to Gregory, a psychological theory which explains how an edited motion-picture film or a TV program communicates, would be of value to the communications theorist and possibly to the practicing communicator. A model of the process may be based on the grammar of modern English; psychological theory may be found which underlies both English grammar and visual editing. Research with specially structured film-clips yielded test data relating to the theory.

"Effect Techniques as an Aid to Low-Budget Production," will be discussed by Wally Gentleman of the National Film Board of Canada, Montreal.

Gentleman's paper will describe the application of various feature film techniques, such as process projection, traveling mattes, painted mattes, model and miniature and optical printing procedures, to low-budget production under the organization of the National Film Board of Canada. The planning and development of the various processes from conception to completion will be dealth with. The integration of varied skills and crafts will be considered and explained by the author.

Two papers in this session will deal with the motion picture industry in Czechoslovakia. Frantisek Pilat of the Czechoslovak Film Corporation in Prague will discuss "Novel Technical Means of Expression in the Motion-Picture Art."

Recently developed technologies in Czechslovakia according to Mr. Pilat, include (1) Polyecran, a system for simultaneous projection on three or more screens, to a maximum of seven screens; disposed in space in various ways. Sections of motion pictures or diapositives are projected onto the screens. The sound accompaniment is directional and stereophonic. The operation is automatized. (2) Laterna Magica is a combination of projected films and diapositives, as well as sound reproduction with the performance of live actors. To this end special systems of technical equipment have been developed.

"Characteristic Features of Czechoslovak Motion Picture Techniques," will be the subject of a paper by Vilem Tarah, who is also associated with the CFC. Traha will point out that the particular results achieved in Czechoslovakia in motion picture production, laboratory processing projection are related to characteristic features of some new technologies and the newly developed technical film equipment. He will indicate the importance of international standards.

A discussion of "Simulated Night Photography Using Color Reversal Films," will close this first convention session. George T. Keene of the Color Technology Division, Eastman Kodak Company, Rochester, N. Y., will review critically the current methods of obtaining night effects in daylight photography and explore possible improvements. An original given two stops overexposure and printed using a printing master will be shown to give a desirable reduction of tone scale, less color saturation, and a more realistic night effect. The required compromise between realism and tone effect will be explained by the author. Night scenes photographed using artificial lights and moonlight will be discussed briefly.

iP

All Exhibit Space Reserved For SMPTE Convention

NEW YORK, N. Y., Feb. 2 — Three months prior to the opening of the 89th Convention of the Society of Motion Picture and Television Engineers, all forty-seven exhibit booths were reserved, according to Exhibit Committee Chairman Kenneth Oakley, and the addition of space was under consideration.

The Convention will take place May 7-12 at the King Edward Sheraton Hotel in Toronto, Canada. Theme of the Convention is: "International Achievements in Motion Pictures and Television."

The equipment exhibit is expected to follow the international pattern of the convention. Many United States companies will travel to Toronto to show equipment and many Canadian concerns at the show will display products from Europe.

Among the companies which have contracted for exhibit space are the following: Beckman & Whitley, Inc.; Bell & Howell Co.; Behrend Cine Corp.; Berndt-Bach, Inc.; Birns & Sawyer Cine Equipment, Inc.; Braun of Canada Equipment Ltd.; Caldwell A/V Equipment Ltd.; Camera Equipment Co.; Canadian Broadcasting Corp.; Canadian Applied Research Ltd.; Alex L. Clark Ltd.; Eastman Kodak Co.; Ferrania Division, Viditon Corp.; Film Editing Equipment, Inc.; Philip A. Hunt Co.; Lipsner-Smith Corp.; MacKenzie Equipment Ltd.; Florman & Babb, Inc.; Harwald Co.; Magnasync Corp.; McCudy Radio Industries Ltd.; Precision Cine Equipment Div.; Robert Rigby Ltd.; L. B. Russell Chemicals, Inc.; S.O.S. Cinema Supply Corp.; Strand Electric Ltd.; and Wollensak Optical Co.

iP

New Cinerama Lens

A new lens which permits the photographing of a 160 degree angle to be used in future production of Cinerama pictures has been developed by Cinerama, Inc.

The lens is a modification of one developed by Cinerama with Boeing Airplane Co. and the U. S. Government for use at the coming Century 21 World Fair to be held in Seattle.

The system, announced by Nicholas Reisini, Cinerama president, and William M. Allen, president of Boeing, employs a single lens to create an audience viewing area of 360 degrees horizontally and 160 degrees vertically. The audience "is said to be" enveloped in a picture surrounding it on all sides and above."

iP

SMPTE Man Named Member of National Research Council

NEW YORK, N. Y., — Dr. Deane R. White, Engineering vice-president of the Society of Motion Picture and Television Engineers, has been named a member-at-large in the Division of Engineering and Industrial Research of the National Research Council, SMPTE Headquarters has announced here.

Dr. White, a Fellow Member of the Society, is Associate Research Laboratory Director, engaged in pioneering research work at the Photo Products Department of E. I. du Pont de Nemours & Co., Inc., Parlin, New Jersey.

In his capacity as SMPTE Engineering Vice-President, Dr. White is responsible for the direction and administration of twelve engineering committees involved with color, film-projection practices, instrumentation and high-speed photography, laboratory practices, film dimensions, screen brightness, 16 and 8mm motion pictures, sound, television, television studio lighting, video tape recording and standards.

iP



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Modern Movie Theater Opened in Sweden

What is probably Scandinavia's most modern motion picture theatre, the Royal, opened on March 16 in Malmo, Sweden, according to Nathan D. Golden, Director, Scientific Instruments, Motion Picture and Photographic Products Division, Business and Defense Services Administration, U. S. Department of Commerce. The projection booth has six projectors, three of which are for special system films, two for 70-mm. films, and one is a standard 35-mm. projector.

There are 750 seats in the trumpet-shaped auditorium, which has its greatest width at the stage. The total screen surface is 20 meters by 8 meters (a meter is 3.28 feet), and is curved in an arc which gives a third-dimension effect to the picture. Maximum accoustic effect has been achieved by making no part of the walls, floor, or ceiling parallel, and also by using materials that have a certain absorbent character, which gives the sound both life and tone.

The air in the auditorium is changed without giving rise to drafts. Fresh air streams in constantly through thousands of small holes in the ceiling.

The operation of the Royal is in the hands of the Gota Film Company, Malmo, which also operates five other motion picture theatres in Malmo.

iP

Ziff-Davis to Publish Photo Research History

A history of photographic research written by the late Dr. C. E. Kenneth Mees, a pioneer in the industrial application of research, has been published by Ziff-Davis Publishing Co., New York.

Entitled "From Dry Plates to Ektachrome Film — A Story of Photographic Research," the new book is written for the advanced amateur and the photographic scientist. It provides a wealth of material about "the theory behind the photograph."

The book has more than 150 illustrations and is documented from Dr. Mees' long experience as director of Kodak Research Laboratories in Rochester, N. Y. The laboratories, which he founded in 1912, were responsible for such photographic innovations as amateur motion pictures and new color photography processes.

In the new book are chapters on the early history of photography and on first applications of science to photography.

Accounts of research on photographic image structure, film sensitivity, developers, sensitizing dyes, and gelatin, illustrate the scientific progress that led to modern photography. The author also tells of the long search that resulted in cellulose acetate for safety-base film.

Other sections of the book are devoted to the history of amateur and professional movies, sound recording on film, color photography, and x-ray research.

iP

Label Idea Helps Identify And Seal Developed Film

An idea that eliminated the manual writing of identification and sealing strips for developed 16mm film resulted in Geoffrey H. Botton, manager of machine accounting for General Film Laboratories in Hollywood, being named a winner in a national contest sponsored by the Allen Hollander Company, Inc.

With the new system, the firm's Order Department uses a "Request for Labels" form, bearing title, quantity, etc., which is sent to the Machine Accounting Department. Here cards are punched, and pin-feed, pressure-sensitive labels are imprinted on the IBM 407. This operation completely eliminates a production bottleneck in which high priced film technicians, of necessity, tediously prepared identification in their own handwriting. Instead, all they do is apply the film reel label to the leader strip. This also solved the problem of sealing the film until ready for projection.

In processing up to a million feet of motion picture film daily, it is necessary to identify reels containing from 50 to 1000 feet, especially in the case of many thousands of TV Commercials which are identical. Using pin-feed, pressure-sensitive labels, the technician easily applies fifteen labels in the same space of time it formerly took to laboriously write out one title with India Ink and dry it before sealing. Neatness, legibility and speed-up in delivery have improved customer relations and good will.

iP

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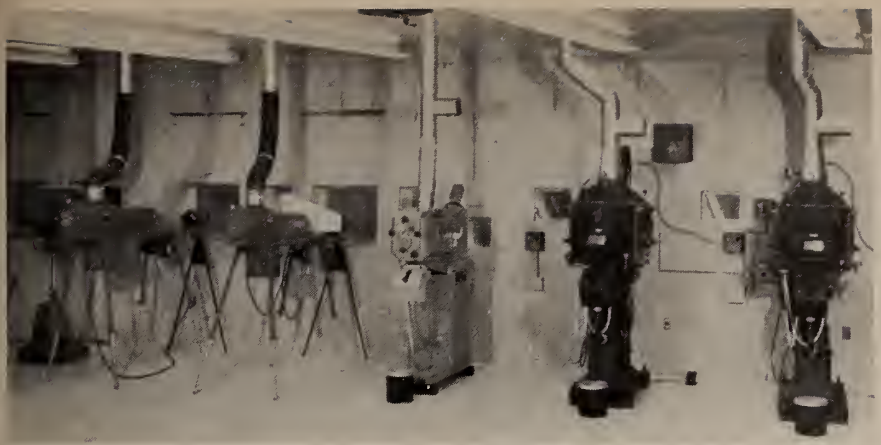
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CHEVROLET BOOTH — One of the most complete and modern projection booths of any industrial company is that of the Chevrolet Engineering Auditorium of the General Motors Technical Center, Detroit. Equipment for large screen projection of 35-mm film includes two Facelite projection arc lamps, and for 16-mm projection an Eastman projector and carbon arc lamp. Two Strong Universal arc slide projectors have a light source so intense that large brilliant pictures can be projected without completely darkening the auditorium. The booth equipment also includes two Strong arc follow spotlights, one of which is at the right and not included in the picture, providing brilliant lighting of all live presentations on stage.

Film Inventor A. F. Victor Dies

PACIFIC GROVE, CAL. — Private services were held yesterday (Mar. 31) for Alexander F. Victor, 82, former associate of Thomas Alva Edison and inventor of the electric washing machine.

The Swedish-born inventor died in a Carmel hospital. He had been in failing health for years. A one-time magician, Mr. Victor was credited with more than 300 inventions.

Most of his inventions involved motion picture equipment, and he gave some of the most important ones to the motion picture industry with no patent restrictions. A non-flammable safety film was his most important. It was adopted as the standard film of the industry. He also developed the first 16 millimeter sound-on-film projector.

iP

PHIL WILKES DIES

PIERRE, S. D. — F. S. (Phil) Wilkes, former theatre projectionist here, died recently at the age of 76. Wilkes was projectionist at the Bijou Theatre from 1908 to 1940. Survivors include his widow; sons Wesley of Seattle, and Don of Kansas City, and a daughter, Mrs. William Angell of Westfield, N. D.

Record Footage from General Film Labs

HOLLYWOOD, CALIF. — General Film Laboratories, the film processing division of Pacific Industries, Inc., San Francisco, turned out more footage of completed film for motion picture and television use in its Hollywood facilities in the first three months of 1961 than in any previous three-month period, it was announced here today (April 13).

William E. Gephart, president of General Film, said the Pacific Industries division here processed approximately 25 per cent more film in the most recent three months than in the same period of 1960.

He described the increase as being part of the generally brighter outlook in the entertainment industries, with both color and black and white film usage increasing. The long-term outlook continues to indicate that the processing of industrial and teaching films will be increasingly important to the General Film division as motion pictures for educational purposes find new users and markets.

iP



Hollywood Craftsmen

By *Robert H. King*

Charlie Haight, one of the old-timers at the original (now demolished) Charlie Chaplin Studios, and I had midnight supper the other night and we were reminiscing about all the crazy thing that happened during the hey-day of picture making. He told me of the time when he burned all the original prints of **"The Champ"** and **"The Kid"** at the Chaplin studios on order of the big boss himself.

It has been a long time since the old 3-strip Technicolor cameras have been used, and they represent a tremendous skill to manufacture. Now they are lying, along with the old 2-strip cameras, on the shelves at the Technicolor plant. New cameras have been created, but recently they brought out one of the old 3-strip cameras and tried a roll of Monopak through it. It was not a successful experiment. Most all Technicolor negative is now, single-strip and is used on conventional Mitchell Cameras.

Jack Martell, assisted by **James Taylor,** of local 705, has been in Tahiti on **M-G-M's** "Mutiny on the Bounty" since before Christmas. The two costumers are dressing 600 natives as well as the full crews of 2 British ships with a full complement of Marines.

Ed Finney, grip on the Warner lot, returned recently by train from Las Vegas was met by his wife at the station, with a clean set of linen and socks, to entrain right back for Las Vegas for another week for Universal and while there for the second hitch received a telegram from Columbia to stay there for an additional 4 days to help line up another epic for the Columbia company.

In the never-ending controversy about pictures made here in Hollywood versus those made on European soil, the Universal-International picture **"Spartacus"** — a $9 million production — has received the blessings of all the IATSE locals here. The

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• LONGER BURNING
• SHARPER PICTURE
Free Test Samples

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• LESS ATTENTION
• PERFECT COLOR BALANCE
Free Carbon Chart





production was made entirely in Hollywood and local locations, and is living proof of the superior quality of the craftsmanship of our local unions.

Phil Rand, camera operator, has come back to a tremendous long list of waiting jobs, from White City, New Mexico from working both there and at Monterey, Calif. for Warner Brothers **"Susan Slade."**

This column would like to express deep sympathy to **George Doan** of the Desilu Productions, Inc. on the recent loss of his wife. George has been for years a close friend of all IATSE, crafts, and in his position as "hiring man" for the big television empire, has endeared himself to many cameramen, grips, electricians, prop men, makeup artists, costumers, and so on down the line.

Kenneth Bell, still photographer for George Pal's **"Atlantis"** has been selected by many trade papers as the still man of the year for his excellence in photographing some of the intricate scenes of this epic.

James Saper, an old friend of this columnist, has been doing exceptionally fine work on the technical photography of Columbia's **"Birdman of Alcatraz."**

Jimmy Carpenter, lamp operator of the Mirisch-U.A. production **"By Love Possessed"** shooting at the old Goldwyn studio, has become a father for the first time at the age 42, Jimmy says, "everything comes to he who waits."

Carson McDonald, considered an artist supreme with the lip paint-brush and the powder puff is getting married at last. Announcement stunned the labor movement all throughout Hollywood. Mrs. McDonald (to be) is the wardrobe mistress on M-G-M lot and Carson officiates on their **"King of Kings"** retakes.

Gordon Avil, member of the American Society of Cinematographers has done a smash-up job on Walt Disney's **"Ten Who Dared".** Some technicials, after looking over the script of "Ten" said it couldn't be done, but Walt had confidence in Gordon Avil, and it is being done.

Shades of the Past! 3-Dimension is about to come back. Authorities in optics have contended that it is possible to achieve 3-dimension effect on the screen without the use of glasses. We wonder!

Incidentally, it might be mentioned in passing, that Hollywood motion picture producers are convinced that 1961 will be one of the best years ever, as far as production and profits are concerned.

Johnny Greenwald, Assistant Director, formerly from the M-G-M lot, and this columnist have had a lot of fun recently talking about the old days of motion picture making. Seems like now there is an entirely new crop of producers coming over the horizon, and the old-timers are on the wane. Johnny, one of the oldest new-comers in the business, thinks it is a good sign. **iP**

Time-Life Documentary Wins Flaherty Award

NEW YORK — "Primary," a 27-minute documentary produced by Robert Drew for Time-Life, Inc., won City College's 12th annual Robert J. Flaherty Award for "creative achievement" at the screening of prize-winning films held in cooperation with Cinema 16 at the Fashion Industries Auditorium on March 29. Honorable mention in the competition went to "Sit-In," produced by Albert Wasserman for NBC-TV network, and "Pow Wow," produced and directed by Allan Downs and Jerome Liebling for the University of Minnesota. **iP**

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Larry Davee Elected to Motion Picture Pioneers

Larry Davee, president of Century Projector Corporation as well as president of the Theatre Equipment & Supply Manufacturers Asso. has been accepted for membership in the Motion Picture Pioneers Inc.

Davee was a member of the original development group at the Bell Telephone Laboratories that developed the Western Electric disc and photographic methods of recording and reproducing sound. As a member of the staff of E.R.P.I. he was manager of the recording work of World Broadcasting Co. during which time the first high speed master copper plating was initiated and the first use of homogeneous recording materials such as Vinelite was used for phonograph records now in universal use.

His most recent innovation announced by Century Projector Corporation is the all-transistorized professional motion picture theatre sound systems now being installed in theatres.

His active interest in the Society of Motion Picture and Television Engineers is well known having been chairman of a number of committees and American Standards, sound recording active participation in the setting of and reproduction as well as projection room practice.

Davee's developments including such innovations as water cooled apertures a necessity for the satisfactory operation with the larger arc lamps required for optimum operation with the larger screens used today. The many contributions to the successful operation of multiple projection processes such as Waller Gunnery Projectors, Cinerama, Cinemiracle etc., are recognized by those using these methods of obtaining peripheral vision in motion picture theatres.

iP

SMPTE, TESMA Discuss New Technical Group

NEW YORK, N. Y., — Members of the Executive Committee of the Society of Motion Picture and Television Engineers met here with executives of the Theatre Equipment and Supply Manufacturers Association to discuss an all-industry theatre improvement program being created by TESMA to fill the void caused by the dissolution of the Motion Picture Research Council.

Following the meeting, SMPTE president John W. Servies indicated that there is no conflict between the new technical organization and the aims and purposes of the Society. "SMPTE has been active for many years," he said, "in gathering and presenting information to guide in high quality theatre presentation of motion pictures and expects to continue to do so. For this reason, we welcome the opportunity to cooperate in these phases of the TESMA program."

Services, SMPTE engineering vice-president Deane R. White, SMPTE financial vice-president Ethan M. Stifle, and SMPTE executive secretary Charles S. Stodter, met with president Larry Davee and vice-president V. J. Nolan of TESMA, to discuss areas of common interest in TESMA's proposed program for close liaison on technological and engineering staffs, film laboratories and others, for the achievement of better theatre operation.

iP

Levine to Make Jobs For U.S. Cameramen

LOS ANGELES, CAL. — Embassy Pictures president Joseph E. Levine told some 300 key West Coast motion picture exhibitors today that he will produce three major motion pictures a year in the United States beginning this summer.

The producer-showman, currently heading his cross-country "Showmanship Caravan" said that "Boys' Night Out" will mark his first production venture in the U. S. The original comedy written by Arne Sultan and Marvin Worth, will begin production in July in Hollywood and New York.

"I cut my eye-teeth on production in Europe this year," Levine continued, "on 'The Wonder of Aladdin' and 'The Last Days of Sodom and Gomorrah.' The pictures and the properties that are owned and being prepared by Embassy Pictures are naturals for production in this country."

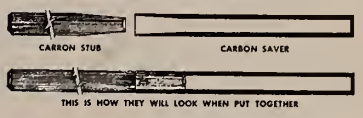
iP

GPL Announces Three Promotions

Three key appointments were announced today by W. J. Tull, Vice president, sales and engineering at GPL Division — General Precision, Inc. John C. Forrest and Dr. Frank N. Gillette were promoted to the respective positions of director and associate director of the Engineering Division. Louis L. Pourciau has assumed the new position of head of the industrial products department of the engineering division.

iP

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Italian Automatic Projector To Be Distributed in U.S.

SAN FRANCISCO, CAL. — The exclusive U.S. distribution rights for Cinevue, an Italian-made automatic, sound-motion picture projector for showing selections of films in public places, have been granted to Don Twomey Associates, Inc., of New York City by the Society International Fonovision of Milan.

The device, which can be either fitted for coin operation or for free institutional or sales aid use, has been marketed in Europe for several years. Extensive test marketing in selected areas on both the east and west coasts are scheduled for early summer as the initial U.S. marketing effort.

Preliminary installations of the 5-foot tall units will be in bowling alleys, super markets, and travel agencies. All units will have 40 film selections, each of 4-minute duration, sound, in both color and black and white. Film topics will range from bowling instruction to recipes and travelogues.

Further marketing plans, according to Hal Fenton, vice president-sales for the visual aid and entertainment firm, call for the establishment of a nation-wide sales and service organization.

iP

Former Strong VP Harold E. Brown Dies

TOLEDO, OHIO — Harold E. Brown, 67, former vice-president of The Strong Electric Corporation, died today (Mar. 29) in his home following illness of over a year. He had retired from business early in 1960.



Brown

Brown joined Strong Electric as office manager in 1935, coming from General Electric Supply Co., and was elected vice-president in charge of sales, in 1954.

He is survived by a wife, Edna, two daughters and a son. Services will be Friday afternoon at the Bennett Funeral Home.

iP

Pay-TV Show Taped For Reshowing

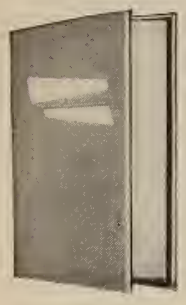
NEW YORK, APRIL 3 — The first video tape recording of a Broadway musical, simultaneously being telecast live to a subscription television audience, was completed Sunday evening by Reeves Sound Studios Division of Reeves Broadcasting & Development Corporation, it was announced today by Chester L. Stewart, president of the Reeves Sound Studios.

Five television cameras were used to record the musical "Show Girl" starring Carol Channing, which was being presented at the Eugene O'Neil Theatre before a live audience. Output of the cameras was fed by coaxial cable to five video tape recorders at Reeves Sound Studios. Simultaneously, the Sound Studios also made three video tape recordings of the program as it was telecast to the Toronto audience.

The five video tapes of the show now can be electronically edited and mixed on Reeves Sound Studios equipment for further showing at future dates. To make this recording achievement possible, Reeves Sound Studios locked all eight recording machines in absolute synchronization with its "synch-servo" process and simultaneously recorded the sound on five other tapes.

iP

How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise — how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

ELECTRICAL NOISE

270 pages, 6 x 9
105 illustrations
$10.00

By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to black-body radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
8. Noise Measurements and Techniques
9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
11. Noise in Communication Systems

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SECTION HEADINGS

(1) Film; (2) The Projector; (3) Projection-Optics, Screens; (4) The Arc Lamp; (5) General Projection Practice; (6) Motors, Generators, and Rectifiers; (7) Sound Reproduction Systems; (8) Projection of Color and 3-D Films, Formulas.

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MIRRORS . . .

. . . Continued from Page 9

on the surface obscures less light because there is no "doubling" of images caused by separation of the foreign bodies from the reflecting surface by the thickness of the glass.

TufCold Cleaning Tips

The cleaning of TufCold front-surface interference reflectors makes a few demands on the projectionist, but requires a procedure different from that ordinarily employed in the cleaning of silvered mirrors. TufCold reflectors should never be scoured with steel wool or household cleansers. Abrasives such as these might scratch the thin optical coating! The scum which tends to form on the glass surface of a rear-surface reflector does not form so readily, and seems to be more easily removed, from the interference coating of a TufCold reflector.

The surface of a TufCold reflector should be periodically brushed with a soft, clean, lint-free cotton cloth to remove dust. Fingermarks, grease-spots, and other stubborn stains may be removed with a soft cloth moistened with lens-cleaning fluid or pure alcohol solution.

Now that Strong TufCold arc-lamp reflectors are available, projectionists operating in large theatres and drive-ins may well wonder how they ever got along without them! In point of fact, the successful operation of such high-powered arc lamps as the Strong U-H-I and Jetarc and the National Constellation and Vantarc are absolutely dependent on the cold-type reflector.

The manifest improvement in projection quality when TufCold reflectors are used in other powerful lamps of the 16-, 16½-, and 18-inch mirror class is at the same time a boon to the projectionist and a vital business-building aid to the exhibitor who strives to present the brightest, clearest, most patron-pleasing movies on his screen.

iP

NEW BROCHURE

The use of carbon arcs for slide projection in theatres is detailed in a new brochure now available. It tells how brilliant pictures up to 30 feet wide can be projected in rooms which need not be darkened. A table for establishing lens requirements is included. A copy of this brochure will be sent to anyone addressing a request to The Strong Electric Corporation, 10 City Park Avenue, Toledo 1, Ohio.

iP

REDUCE LIGHT LOSS

with the New Long-Service First-Surface (front coated) Tufcold Dichroic Mirrors

1 Projected light is reflected from the front surface and without passing through the glass twice as with second surface mirrors.

2 Maintain maximum screen illumination, reduce film buckle and improve focus. No emulsion blistering regardless of the power of the arcs.

3 Show less coating deterioration or pitting by ejections from the arc than second surface reflectors.

NEW reflectors afford the lowest cost way to picture brightness. How long since you last replaced yours? You should do so regularly.

Write for data on correct sizes and type for your lamps.

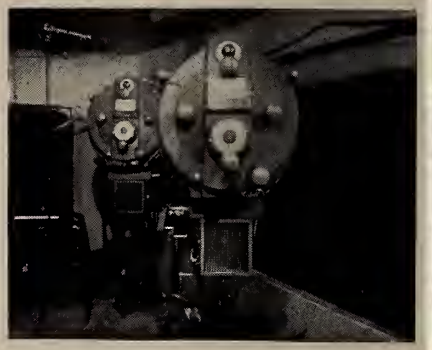
THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE • TOLEDO 1, OHIO

Manufacturers of Reflectors for 25 Years

Strong Introduces New Spotlight

A new direct current carbon arc follow spotlight designed to project an intensely brilliant uniformly illuminated spotlight and wide range flood at short throw has been announced by The Strong Electric Corporation.



STRONG SPOTLIGHT — The first installation of the Super Trouper Specials has been made at the Latin Quarter in New York City.

Designated as the Super Trouper Short Throw Special, this equipment delivers a snow-white light which is 2½ times the intensity of previous equipment which afforded similar coverage. It furthermore permits an inclusive light coverage which is twice that of previous equipment of comparable power. These advantages are particularly appreciated where a large floor, platform or stage must be brilliantly lighted from a short distance.

A self-contained power supply unit consisting of a transformer and selenium rectifier, eliminates the need for maintaining separate and expensive rectifiers or generators. It draws only 20 amperes from a 110-volt convenience outlet.

The optical system uses a silvered glass reflector to collect the illumination from the source and direct it to a circular aperture, from where it is projected to the stage by means of a two-element variable focal length lens system, controlled by a single lever.

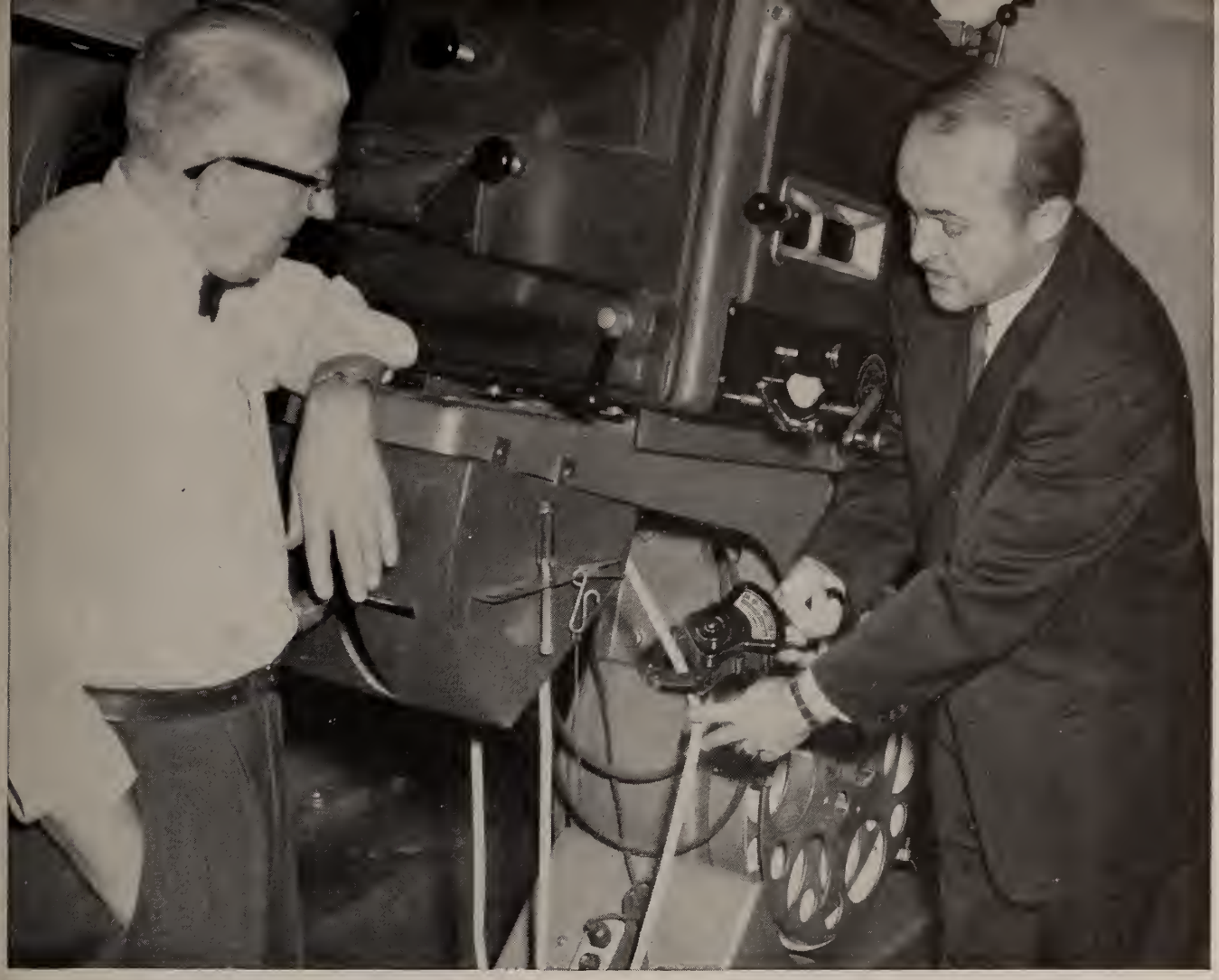
iP

New Arc Lamp Mirrors From Strong Electric

Production of a new first-surface dichroic mirror for use in projection arc lamps has been announced by The Strong Electric Corporation, Toledo.

These front coated reflectors, which are being marketed under the name of Tufcold are said to afford a longer period of service. The projected light is reflected from the front surface and without passing through the glass twice as with second surface mirrors.

iP



YOUR NATIONAL CARBON ENGINEER...

Sells you the best product—gives you the best service!

The illustration shows a NATIONAL CARBON Sales Engineer using a "Tong-Test" ammeter for taking direct ammeter readings to determine quickly and accurately the A-C or D-C readings for any lamphouse.

Without interrupting the show, the readings are made by simply snapping the ammeter around the lead wires carrying current to the positive and negative carbons.

This is just one more modern tool carried in each sales engineer's service kit to help him assist you on any lighting problem and to help you realize the ultimate in picture quality.

Use "National" projector carbons and call on NATIONAL CARBON for free technical service. For details, ask your NATIONAL CARBON supply dealer or write National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, New York. IN CANADA: Union Carbide Canada Limited, Toronto.



This "Tong-Test" ammeter — equipped with interchangeable scales — is another of the many precision tools carried in each NATIONAL CARBON Sales Engineer's Kit.

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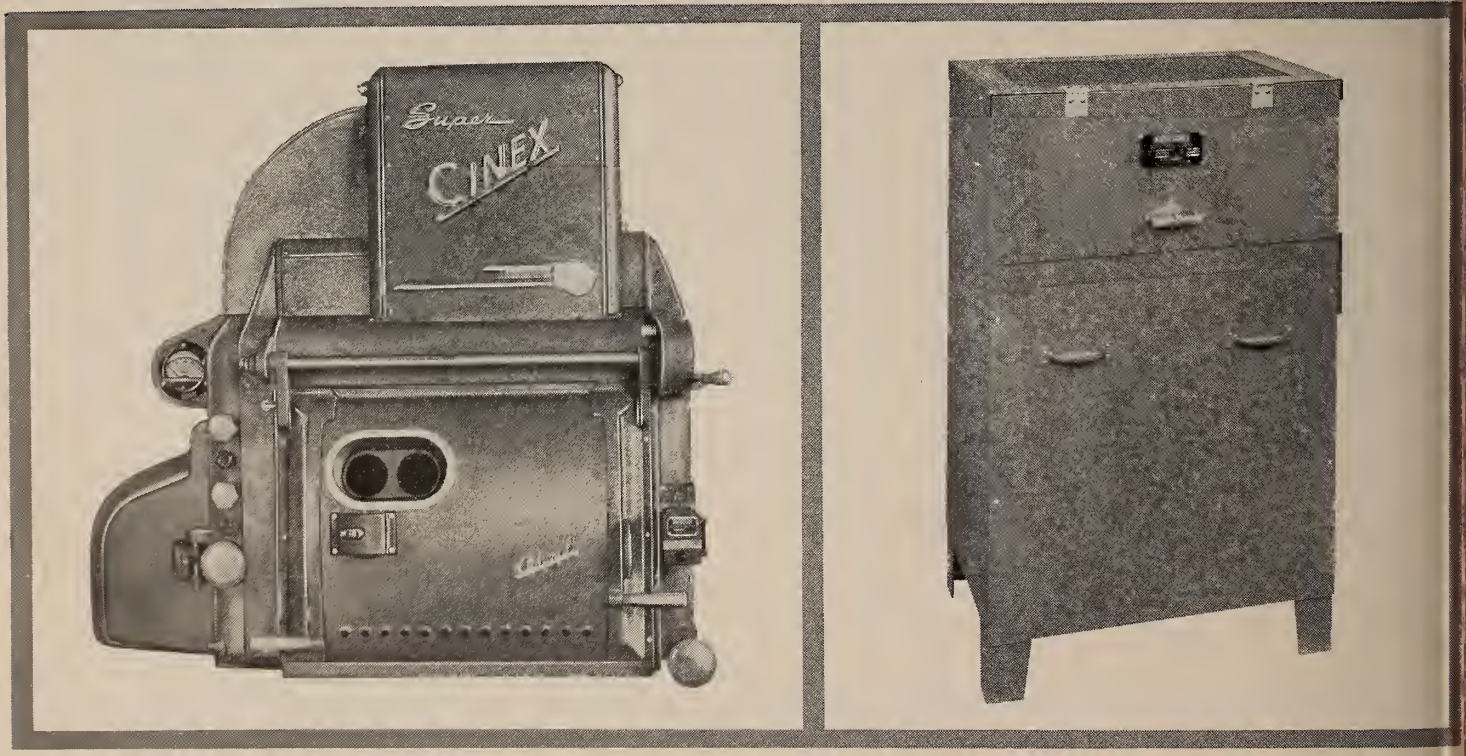
UNION CARBIDE

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PROJECTION LAMPS AND RECTIFIERS

FOR 70 NEW THEATRES



In "the largest single order for motion picture theatre equipment ever given out" . . . it is noteworthy that ASHCRAFT Projection Lamps and ASHCRAFT Hi-Reactance 12 phase Rectifiers were the only equipment of the kind on the order. Thus 70 new Cinerama theatres join an ASHCRAFT-equipped group of theatres that includes every leading theatre on Broadway and practically every leading theatre in the free world.

■ *For lighting systems of incomparable brightness, efficiency and dependability . . . there are no substitutes for Ashcraft products.*

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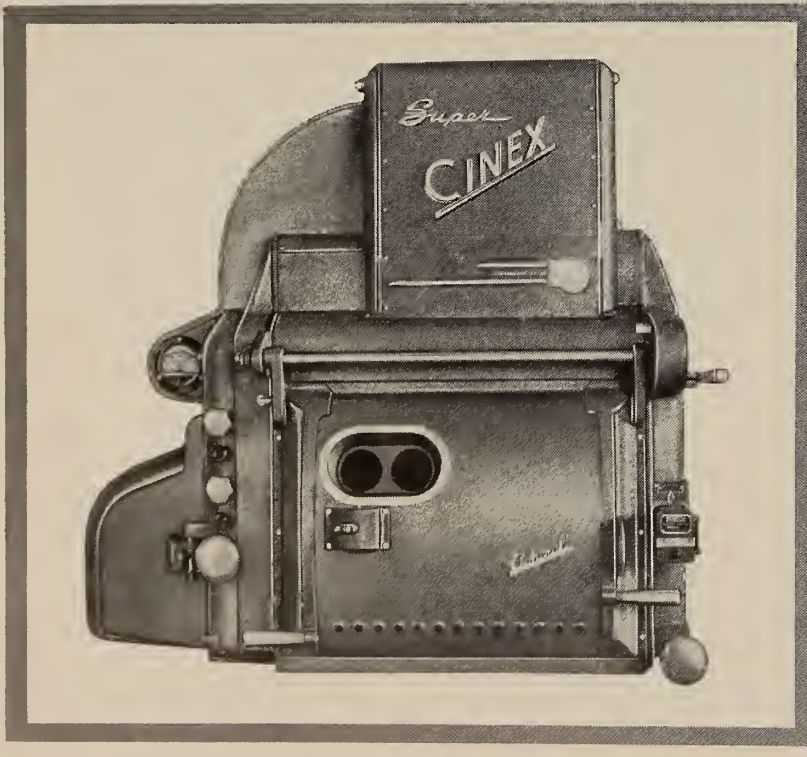
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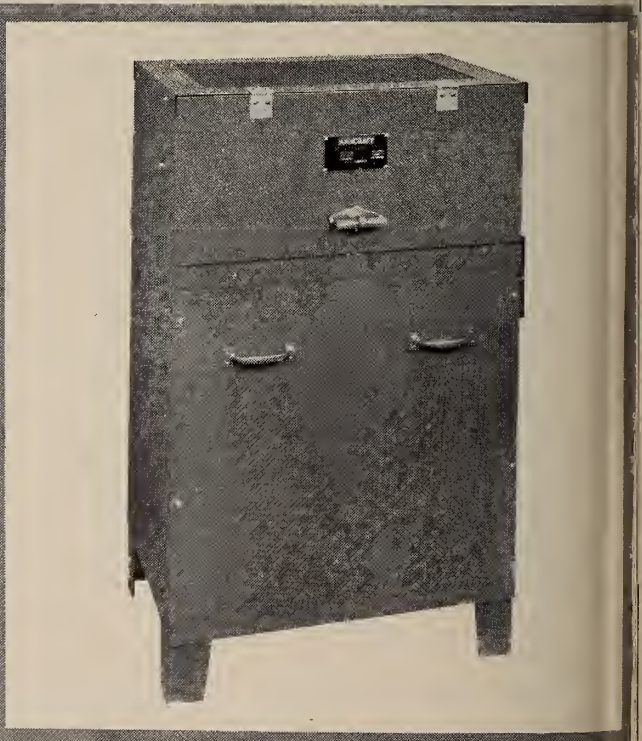
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INTERNATIONAL
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Including a special Audio-Visual section relating to the operation and maintenance of A-V equipment in the educational and industrial fields.

Volume 36 **May 1961** **No. 5**

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New York 17, N. Y.
Murray Hill 7-7746

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneopolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizobeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND ond ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year ond $7.00 for two yeors. Chonges of address should be submitted four weeks in advonce of publicotion date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personol opinions appearing in signed orticles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

History Can Repeat Itself for Projectionists with Growth of Pay-TV

Although those of our craft who are now connected with television — and there are many of them — may not agree with us, it was really sort of pleasing to hear Newton Minnow, new chairman of the Federal Communications Commission, term television a "vast wasteland." However, his support of pay television is distinctly disturbing and those of us who put Mr. Minnow in office should perhaps take time to examine the situation and to realize that many of the smaller theatres face another heavy blow with the commercial advent of pay television.

When motion picture producing companies are participating in pay television it is bad enough, but if the government gets into the act and gives its categorical blessing to pay television, we are all going to be in trouble that will make the wholesale theatre closings of a decade ago seem like child's play.

After all, everyone is convinced that the current upswing in motion picture theatre prosperity is due to the big pictures — the big print size, the new theatres and comfortable surroundings, even the hard tickets, and the presentation of pictures which cannot be done justice to by television.

When it becomes possible for the father to stay home with his four kids and watch "Spartacus" or "Ben-Hur," we had better forget about those plans for air conditioning our projection room and start looking for jobs in the neighborhood gas station.

Phillip F. Harling, who is chairman of the Anti Pay T-V Committee of the Theatre Owners of America, said TOA is "particularly pleased" because Leroy Collins of the National Association of Broadcasters had said that the NAB was "unalterably opposed to pay television." (You remember Collins as the up-and-coming governor of Florida and Democratic keynoter.)

"While the interests of your industry and of ours could be deemed to be self interest, we are both in the same camp when the public interest is involved," Mr. Harling said. Here is Mr. Harling's comment on how Commissioner Minnow got into the act:

"In his support of pay tv, he referred to the 'strangulation of the baby in the crib' and declared that in his opinion pay television should be given a chance to be tested. I cannot conceive how the chairman, new in his job, and not having taken any part in the proceedings on pay tv both before his F.C.C. and the House committees, can make a statement of this kind, particularly when an appeal is presently pending in U. S. Court on the Phonevision test authorization (an FCC order made before Minnow took office). I believe the propriety of such a statement in view of the pending court action would be open to questioning."

When the government agency which controls broadcasting sets itself up as an authority as to what is good and bad for both the pay television and the motion picture industry, we believe it is time to ask exactly where the self interest lies. Certainty the exhibitors and projectionists should be on the same side in this controversy. It is their livelihood which is once again being threatened.

Frank Cooley

INTERNATIONAL PROJECTIONIST

Volume 36 May 1961 Number 5

Revised Standards Set Up for 35mm Sound Prints

Two revised American Standards in the field of motion pictures covering dimensions and locations of normal center-line type and offset center-line type sound records and scanning area of 35mm double-width push-pull sound prints have been approved by the American Standards Association.

The new standards are "Sound Records and Scanning Area of 35mm Double-Width Push-Pull Sound Prints, Normal Center-Line Type, PH22. 69-1960," and "Sound Records and Scanning Area of 35mm Double-Width Push-Pull Sound Prints, PH22. 70-1960."

Copies of the standards are available for 40 cents each from the American Standards Association, Dept. PR-213, 10 East 40th Street, New York 16, N.Y., Administrative sponsor of the committees which developed the standards was the Society of Motion Picture and Television Engineers.

"Film Doctors" Move Into 8mm Field

"Film doctors" for more than twenty years, Rapid Film Technique, Inc., 37-02 Twenty-seventh Street, Long Island City, N. Y. is expanding its film repair and rejuvenation service to include the 8mm field, Jack Bernard, President, announced today.

More than 400 camera store dealers throughout the country will represent Rapid Film Technique, Mr. Bernard announced prior to the opening of the Master Photo Dealers and Finishers Association show, beginning on March 12 in Philadelphia.

Through retail photo dealers nationally, the company is offering its specialized service to 8mm motion picture fans. As pioneers in film repair and renewal, Rapid Film Technique numbers among its professional clients some of the top motion picture companies and industries which use audio-visual programs.

The company has developed highly specialized equipment to handle 8mm movie film, color and black-and-white, Mr. Bernard said. It will now offer amateurs all the film-doctoring advantages previously available only to professional producers or companies with large film libraries who use 16mm and 35mm film.

The process developed by Mr. Bernard's firm, Rapidweld, combines mechanical and chemical steps to repair film damage and remove scratches. Also, a protective coat is applied to guard against future damage. Black scratch lines which often come through a film and eventually gouge-out a picture are actually eliminated. Rapidweld also removes oil stains, fingermarks, dirt, annoying "rain" and other blemishes. Repairs also correct poor splices and brittleness.

Mr. Bernard said that his service through retail outlets will be on a low-cost basis, designed to attract 8mm amateurs who are anxious to preserve films in "original screening" condition.

iP



CONTESTANT — Maureen O'Reilly, Beautiful Bronx, N.Y., redhead, was one of the finalists in the "Miss Union Maid of 1961" contest held in New York recently. The vivacious colleen is employed as a receptionist at Metro-Goldwyn-Mayer offices there and was the only finalist working for a motion picture company, thus perhaps a part of our craft. She represented Local H-63 of IATSE — the home office employees union.

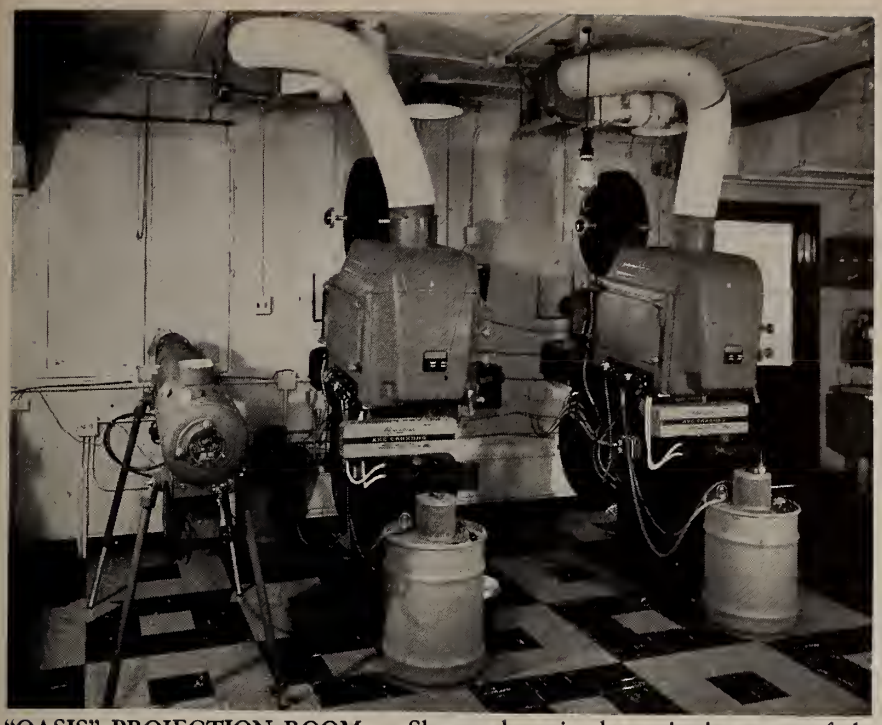
"SPACE CAMERA" TO SMITHSONIAN

WASHINGTON, D. C. — At brief ceremonies this morning at the National Air Museum's Air and Space Building, the Smithsonian Institution will receive from the General Electric Co. the original "Space Camera," the first to take motion pictures of the earth from an altitude of more than 300 miles, together with the recovered capsule and a print of the film made on the flight. The gift will formally be made by Mr. Hilliard W. Paige, general manager of General Electric's Missile and Space Vehicle Department, Philadelphia, and will be received by Dr. Leonard Carmichael, secretary of the Smithsonian Institution.

ETTINGER NAMED

LOS ANGELES, CAL., — Edward E. Ettinger has been elected executive vice president of Technicolor, Inc., it was announced today (11) by Patrick J. Frawley, Jr., chairman and chief executive officer of the Company. Ettinger moves to Technicolor from the post of Vice President, Eversharp, Inc. He is a director of both companies and was formerly executive vice president of Paper-Mate Pen Company.

iP



"OASIS" PROJECTION ROOM — Shown above in the projection room of the Oasis Outdoor Theatre, Elmhurst Road at Touhy and Higgins near Chicago is the Strong slide projector used by owner Oscar A. Brotman between shows.

Slide Projector Essential Equipment, Says Drive-In Owner

Oscar A. Brotman has discovered so many uses for a slide projector at his Oasis Outdoor theatre, Elmhurst Road at Touhy and Higgins, near Chicago, that he considers it an integral part of his booth equipment and program presentation.

"In fact, it is difficult to believe that a first-run drive-in theatre can operate without one," says Brotman.

A few of the principal uses to which he puts this Equipment include the presentation of song slides. A tape was made, with appropriate music spaced ten seconds between songs, for gag slides. Standard old time melodies are intermixed with the latest pop tunes, "most of the younger generation, having never seen song slides, get a big kick out of them" says Brotman. "Slides tell them to open their car windows and sing loudly. They do just that."

During the projection of coming attraction trailers he projects a date strip at the bottom of the screen. It makes the trailers more effective, inasmuch as the date is on the screen throughout the trailer, not just at the beginning or end.

Sales at the concession area are promoted throughout the evening and a reminder slide that "the snack shop is closing in ten minutes" gets a rush of business that might otherwise be lost.

Merchant advertising is sold for screen presentation. These ad slides are confined to a ten-minute interval but the charges run well into five figures every year, which is important extra revenue to any theatre.

During the projection of titles and credits and black and white film a colored gelatin wheel is used to embellish screen attractiveness.

A colored curtain, or screen surround is projected during the running of shorts.

Pictures of patrons in the concessions area are taken with Polaroid Transparency film and shown on the screen the same night.

On Saturdays Brotman projects slides urging patrons to go to church Sunday.

"There is no question that slide projector is a must in a drive-in theatre," says Brotman.

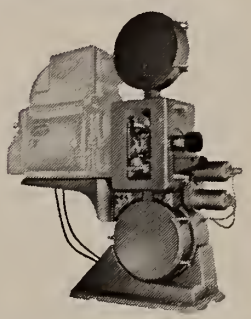
Reports from other drive-in operators using slide projectors tell of many other uses, such as calling doctors during the show, showing pictures of lost children, the taking of Polaroid pictures in the downtown shopping area, passing out cards urging attendance and awarding prizes to those whose pictures are projected on the screen. The awarding of prizes of tickets and refreshments to those whose pictures are taken in the concession area increases sales for those using this service. Some exhibitors project the pictures the night they are taken, while others project them on the next change of feature, figuring it to draw return business. **iP**

Problem

How to project a bright, sharp picture on a huge outdoor screen 400 or 500 feet away from the projection booth?

Answer

70mm and Norelco Universal 70/35mm Projectors



There's a big difference between 35mm and 70mm projection. This difference is especially apparent at a drive-in theatre where it is vital to get the maximum amount of light on the screen.

The larger aperture of the NORELCO 70/35 allows 3 or 4 times as much light to pass through. And the picture is far sharper, too, because the larger film image is blown up only a fraction as much.

Projectionists are reporting runs as high as 2000 per 70mm print; and that complete conversion from 70mm to 35mm takes less than 4 minutes. No wonder the NORELCO Universal 70/35mm projector is the most widely used, most thoroughly proven 70mm projector in the world.

See your favorite theatre supply dealer today.

Write for new descriptive brochure

Norelco®
UNIVERSAL
70/35mm PROJECTORS

NORTH AMERICAN PHILIPS CO., INC.
Motion Picture Equipment Division
100 E. 42 St., New York 17 • OX 7-3600



AT THE "HALL" — Radio City Music Hall early morning opening crew. Left to right: Ben Olevsky, chief of projection, Jack Sturim, Bill Nafash, (assistant chief) and Ed Laursen.

HIGH-STANDARD MAINTENANCE AT RADIO CITY REVIEWED

By Ben Olevsky, Chief of Projection at New York City Radio Hall

as told to

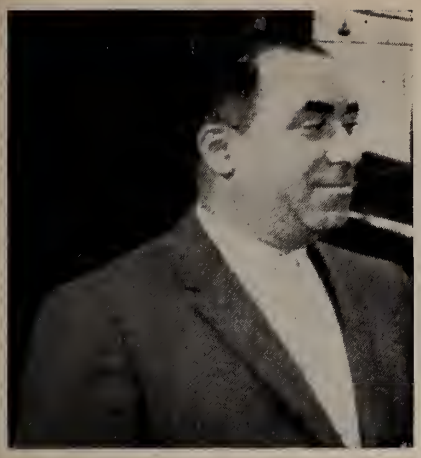
International Projectionist Managing Editor, Ray Gallo

Your "IP" roving reporter was one of thousands waiting in line to get into the Radio City Music Hall during Easter week, and wondered why, with so many theatres in and around the Times Square area, people from all over the world wanted to subject themselves to such a "long wait" to see a show. Of course we knew, from traveling around a bit ourselves, that there is only one Radio City Music Hall in the entire amusement world, but we had not really figured out why, on a holiday or any other time, the "Hall" pulls 'em in, while several Broadway theatres can accommodate you without much waiting. Well, we had a hunch that the wonderful "Glory of Easter" stage production (an annual revival by the same creator of "The Nativity") and Walt Disney's "Absent-minded Professor" screen attraction, had something to do with it, but to make sure, we decided to ask the one guy who had the answers.

Here, Ben Olevsky, chief of projection, states exactly the reasons for the people's preference to see and enjoy Radio City Music Hall's picture presentation.

"When the picture goes on the screen here, it must be flawlessly projected and it must stay there. Our crew of experts has been selected for its technical know-how and must make sure there are no mechanical interruptions to annoy our vast audience of regular patrons. Good maintenance of all projection and sound equipment takes top priority here every day of the year. This daily examination goes on before the show opens and after the last performance, as well as during the performance. In that fashion we avoid breakdowns and program interruptions. Everything is important — every unit of equipment, every component part must function faultlessly as a single unit to forestall such breakdowns.

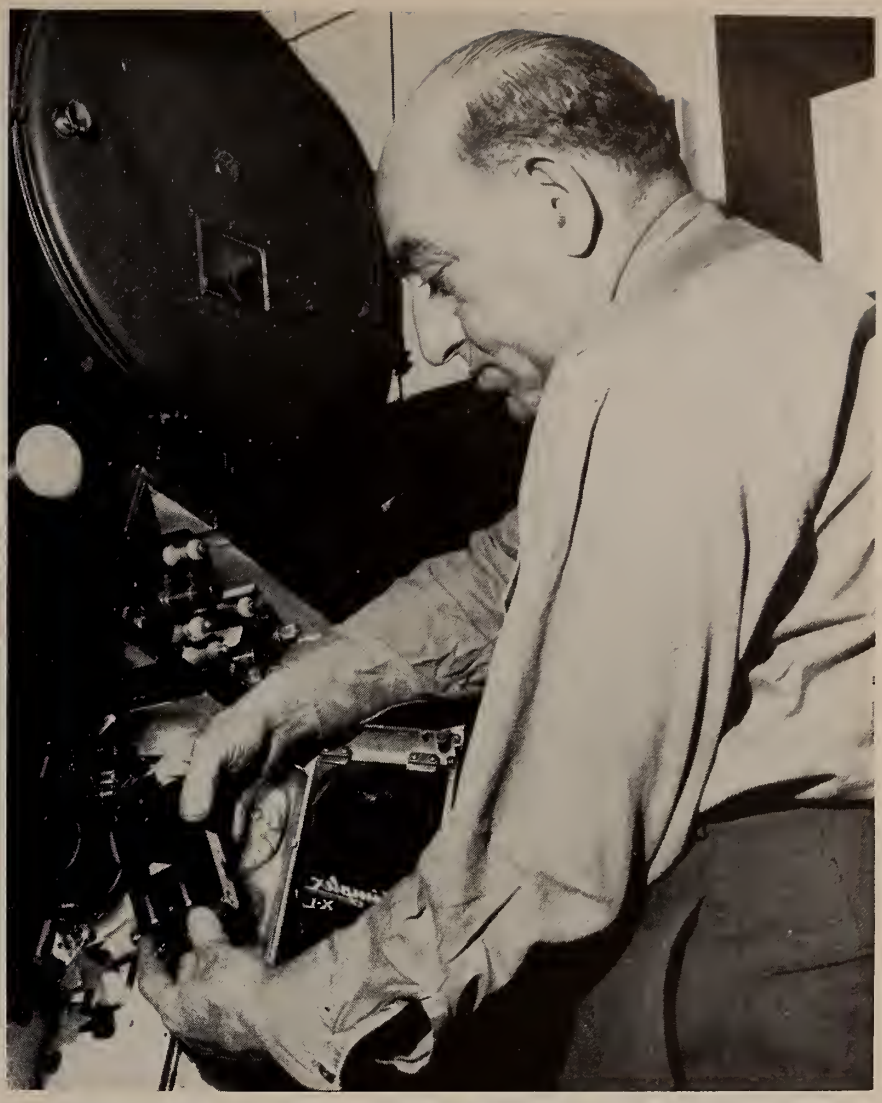
"First of all, we start with the very best modern equipment. For instance, we have four Simplex XL projectors, each for use at one time or another for news-reel or special effects. Yet any one of these projectors is part of our standby system in connection with our regular program. In 11 years of operation they have never been removed for



Ben Olevsky Checks . . .

Adjusting . . .

W. G. (Bill) Nafash, assistant chief projectionist at the Music Hall, is shown at the right as he adjusts the gate and film trap. All projectors and allied equipment are checked daily as a part of the morning routine. Even slightly dirty film contact rollers or shoes can cause serious damage to film.



Replacing . . .

Preventive maintenance is the soul of flawless performance, as Ed Laursen, Music Hall projectionist, emphasizes at the right with his replacement of the high intensity arc lamp positive contacts. Constant attention to detail by Ed and his coworkers are necessary before the projected picture meets their requirements, those of the Research Council—and finally, the viewing public.



Music Hall Projection

Continued on Page 12

NTS Now Manufacturing Optical Alignment Kit

As a service to the industry, National Theatre Supply Company has acquired the rights to manufacture and distribute the Projection Alignment Kit formerly made available by the Research Council of the Motion Picture Association of America it was announced by W. J. Turnbull, President of NTS in New York this week.

Production of the initial run has been started and kits will be available through National Branch sales offices within two weeks.

The Projection Alignment Kit has been termed one of the most important achievements of the Motion Picture Research Council. It aids projectionists in lining up projectors and thus improving light efficiency and picture quality.

One of the outstanding features of the optical alignment tool is that it can be used with the projector in full operation, that is the arc burning, the dowser open and the projector running.

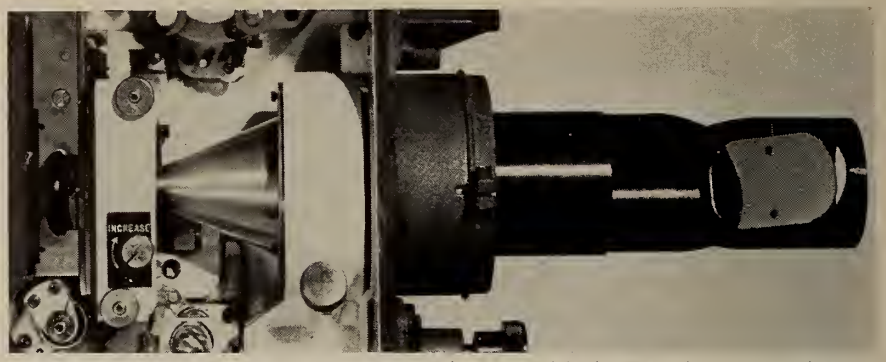
The convenient alignment tool enables the projectionist to achieve optimum light distribution and excellent focus over the entire screen. The lens and film centers will be perfectly in line with the center of the screen.

Inadequate alignment of the Arc Lamp film plans and optical components of the projection system minimize the technical advances provided by modern projection equipment. Maximum performance at a minimum of cost can only be achieved by a near perfect alignment of all of the components of the projection system. The projector alignment kit engineered by the Motion Picture Research Council and now being manufactured and distributed by National Theatre Supply Company, provides an economical positive method for obtaining peak performances at all times.

Because of the great need for higher standards of projection National is making this Alignment Kit available at a price to cover the bare manufacturing cost.

The Research Council optical alignment tool is the first such equipment which enables the projectionist to line up the illumination and optical systems under actual operating conditions.

The optical alignment tool consists of two main parts. First, a lens extension tube with its attached cone and second, a removable tube with an observation mirror. The smaller end of the cone is, in effect, a pinhole camera which focuses an image on the ground glass in the large end of the cone. This ground glass has a center marking and concentric rings for the purpose of alignment. The removable tube holds a mirror which is used to view the image on the ground glass from the operating position at the projector. During shipment, the mirror end is inserted in the lens tube. For use, this tube is removed and reversed so that the mirror is visible.



ALIGNMENT TOOL — The Optical Alignment Tool inserted in a Simplex XL Mechanism is used to align the illumination system with the optical axis of the lens.

The optical alignment tool is first used to position the lamp house mirror on the optical axis of the projection lens and second, in conjunction with the all-purpose 35mm alignment film, to make the center of the image on the film coincide with the optical axis. (70mm equipment should be set up for 35mm operation.) Instructions for use of the tool are as follows:

The first procedure is to center the mirror on the optical axis.

First remove the lens from the projector and insert the alignment tool in the lens holder with the pointed end toward, and approximately one inch from the film gate as shown in the illustration above. Projector with 4" O. D. lenses will require that the alignment tool be mounted in a reduction adaptor ring.

Recheck to be sure that the end of the cone is approximately one inch from the aperture.

Strike the arc and with the projector running, open the dowser.

Rotate the inner tube and tilt the observation mirror until an image of the ground glass can be seen in this mirror from a convenient operating position beside the projector.

The image of the lamp house mirror will appear as an illuminated disc and the shadow image of the carbon holder will appear inverted extending upward from the center of the illuminated disc. On lamp houses which have the negative and positive carbons in line, the shadow of the negative carbon tip will also appear in the center of the illuminated disc as a small jagged-edged dark area.

Operate the horizontal and vertical mirror adjusting knobs until the most uniform illumination on the ground glass has been achieved. The position of the positive crater with respect to the mirror determines the color and uniformity as seen on the ground glass.

If the field is blue move the crater toward the mirror, if the field is brown move the crater away from the mirror and readjust the mirror controls until a uniform white illumination appears on the ground glass.

Loss of mirror reflective coating will show dark blotches on the ground glass and cannot be corrected by adjustment.

Observe the position of the illuminated disc with respect to the concentric circles on the ground glass. If the mirror is on the optical axis of the projection lens, the disc will appear centered on the ground glass. If the mirror is off the optical axis, it may be centered by moving the lamp house either horizontally or vertically or both until its image is centered on the ground glass.

If the lamp house has been moved, readjust the mirror controls until even

"GONE WITH THE WIND" BEATS "BEN-HUR"

From the projection room of Loew's State Theatre comes word that will interest film buffs. The running time of "Ben-Hur," due to leave the State April 23rd to make room for "Gone With the Wind," which opens here on the 26th, is only seven minutes less than that of the memorable David O. Selznick production.

"Ben-Hur" runs for a mighty 213 minutes but just misses the monumental 220 minutes of Metro-Goldwyn-Mayer's Civil War epic.

Projectionists might well shudder at the prospect that someday "Ben-Hur" and "GWTW" will be shown as a double feature. By that time, perhaps the black horses will have won the chariot race and the South the Civil War!

illumination is obtained.

For projectors having condenser type lamp houses, proceed as follows: The optical alignment tool is inserted in the projector as described for mirror arc lamps.

With the condensers removed from the lamp house and the arc operating, an image of the crater will be seen on the ground glass as viewed through the observation mirror. This crater image should coincide with the center marking on the ground glass. If it does not, the lamp house assembly with the positive carbon holder should be moved until the crater image is centered.

When this adjustment has been made, replace the condenser lenses. With the arc operating and the dowser open, the outer rim of the condenser will appear as a distinctly visible circle. This visible circle should be adjusted until it is concentric with the circular rings on the ground glass. This is accomplished by means of the vertical and horizontal adjusting screws on the condenser socket.

The next step is to center the film path on the optical axis.

Move the alignment tool to place the tip of the cone approximately **one-half inch** from the aperture.

Make a loop from the projector alignment film supplied with the kit.

Thread up the loop in frame and with the arc burning run the projector.

Frame so that the center white diamond on the test film is vertically centered on the ground glass. If the film path is exactly on the optical axis, the horizontal position of the diamond will also appear centered.

In practice exact horizontal centering is rarely obtained because of film shrinkage and normal manufacturing tolerances.

If the center dot on the ground glass is within the width of the diamond, the horizontal centering may be considered satisfactory.

If the center dot is outside the diamond realignment of the film path is necessary. Repositioning of the film path to correct for an off-center condition requires repositioning of guide rollers, fixed guide rails and the intermittent sprocket.

The next stop is to position the projector axis on the center of the screen.

Remove the alignment tool, replace the projection lens and project the test film on the screen with the aperture removed.

If the projector is pointing to the exact center of the screen, equal numbers will appear at the top and bottom masking and at the side masking. If equal numbers do not appear, the test film image should be centered on the

(Continued on Page 18)

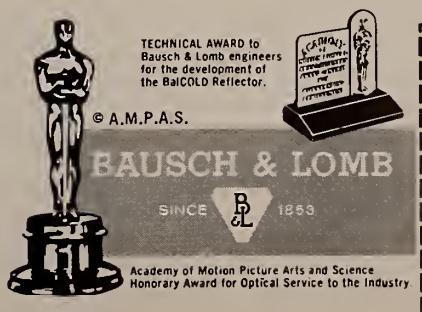
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And BalCOLD far outlasts silvered reflectors. Next time you replace silvered reflectors, replace them with BalCOLD—the only reflector whose proven contribution to the advancement of motion picture projection has won for its designers the highly regarded technical award from the Academy of Motion Picture Arts and Sciences.



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Today—people everywhere "go to the movies"—to laugh and cry together . . . to "get out of the house," away from it all, into a world of illusion and make-believe, a world in which they're loved and beloved—conquerors, swashbucklers—anything, everything their hearts desire.

No wonder so much time, money, and materials is spent in making motion pictures more effective. Nor is it any wonder that this investment is so rewarding, or that the Eastman Technical Service is constantly engaged in helping the industry solve its questions of production, processing and projection.

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AT "THE HALL" — The Research Academy projection test film is a regular part of the quality control program at New York City's Music Hall. Here, projectionist Jack Sturim threads the test strip.

MUSIC HALL PROJECTION

. . . Continued from Page 7

any overhaul. I think we can say this was due to the expert installation by National Theatre Supply Company engineers in 1950. We have replaced some of the film contact parts for even slight wear, but no intermittent movement of these projectors was ever replaced or removed for general overhauling. All of this has produced a projected picture well within the standards set by the Research Council. One of our daily morning routine steps is to check all projectors and allied equipment, and see that it is spotlessly cleaned. A small speck of dirt or grit on any of the film contact rollers or shoes can cause serious damage to the film. So we remove gate, trap and spotsight box covers and see that they are thoroughly cleaned. All take-up attachments and lower magazines are also cleaned and checked, although they really need no adjustments for tension. We clean the travel parts after each reel is projected.

"Now as to our lamphouses — we give them the same meticulous attention as our projector system. Our Peerless Hy-Candescent Arc Lamps were designed for easy accessibility for maintenance, and their high speed optical system is ideal for the very critical projection conditions here at the Music Hall. We carry a current load of 160 amperes at the arc, and we make sure that the full load reaches it at all times.

Curved Gates, Air Cooled

"All our projectors are equipped with curved gates and are air cooled. We selected the Bausch & Lomb Dirotic heat deflectors with a separate blower to reduce heat on the film. Our screen is replaced every six months. We just installed a new Hurley Super-Optica screen. We believe there is no substitute for a new screen."

After listening to Ben Olevsky and learning more about the high standard of projecting pictures on the Radio City Music Hall screen, we now know why everybody — well, almost everybody — wants to get into the Music Hall. You get a darn good show and it's well worth the price of admission.

We feel that if all exhibitors and their technical staffs applied a policy similar to the above, perhaps more people would be going into the thousands of neighborhood theatres throughout the country. If projection and sound are faulty and bad due to run-down and worn out equipment, and seats are falling apart, the theatre owner is not going to get people out of their comfortable living rooms and into his theatre. A great picture, alone, is not enough. It seems to us that most of the existing old equipment should be retired to the junk pile and new and better systems used.

iP

California Colleges To Install Closed-Circuit TV

Six California state colleges will be equipped with closed circuit television systems for one of the most extensive programs of instruction by television ever undertaken at the college level, the California State Department of Education and the Radio Corporation of America announced today.

The campus networks will be used both for carrying studio-originated lectures and demonstrations to classrooms and for vocational training in television broadcasting.

iP

Martin Named Chairman Of 1961 NAVA Convention

FAIRFAX, VIRGINIA — Mahlon H. Martin of M. H. Martin Company, Massillon, Ohio, has been named General Chairman of the 21st Annual National Audio-Visual Convention to be held July 22-25, 1961, at the Morrison Hotel, Chicago, according to an announcement today by Harvey W. Marks, president of the National Audio-Visual Association.

Martin, who is the Association's first vice-president, predicted that the 1961 NAVA Convention will be the largest meeting of audio-visual people ever assembled.

iP

WILLIAM MUHLIG DIES

William J. Muhlig, member of the Chicago Moving Picture Operators' Union, Local 110, IATSE, passed away April 2.

iP

New Film Series on Photography

NET Film Service, Indiana University, has released for either purchase or rental a series of five 16mm black and white films entitled "Photography — The Inclusive Art." The series of 30-minute programs features one of America's outstanding photographers, Ansel Adams, as he explains the techniques and philosophies which can transform photography from a mechanical record to a delicate and sensitive art. The series was designed by Station KQED in San Francisco to increase a viewer's appreciation of the art of photography.

Ansel Adams, the host and featured personality in the series, has become one of the most studied of America's photographers. Aspiring photographers study Adams' "zone system," which is the application of scientific principles to photographic techniques. His textbooks, such as **"This Is the American Earth," "Born Free and Equal," and "The Land of Little Rain,"** demonstrates not only his technical ability but also his rare poetic vision of the art of photography. Adams helped found the first museum department devoted to photography as a fine art, was photography exchange director at the San Francisco World's Fair, has twice held a Guggenheim Fellowship, and has been a photo consultant to the Department of the Interior and the U.S. Army.

Individual programs included in the "Photography — The Incisive Art" Series are:

"Photography as an Art." In this program, Adams is seen as he photographs Yosemite National Park, conveying through his pictures a sense of discovery and rediscovery. A collection of his photographs spanning thirty years are shown and Adams explains his methods of teaching photography and acknowledges his debt to other photographers.

"Points of View." This program shows Ansel Adams photographing an old house and its inhabitants from many different perspectives and with many purposes in mind. He explains that sensitive photographers can become photo-poets.

"Technique." Adams discusses light, interpretation, the use of different filters, exposures, ranges, and magnification, illustrating each from his own vast collection of photographs. The program centers around his demonstrations of various techniques to achieve given effects.

"Professional Photography." Photography as a profession is discussed by Adams and Milton Halberstadt, an outstanding commercial photographer in San Francisco. Adams is shown applying his imagination and techniques to industrial photography, advertising photography, and portrait photography.

"The Language of the Camera Eye." Adams and Beaumont Newhall, director of Eastman House in Rochester, N.Y., analyze the photographs of such distinquished artists as Edward Weston, Cartier-Bresson, Edward Steichen, Alfred Stieglitz, and others. Mr. Adams explains the development of his own philosophy of photo-poetry and how it has influenced his work. **iP**

"SPACEARIUM" LENS

Larry Davee, president of Century Projector Corporation, announced this last month that it had been commissioned by Cinerama Inc. to design and manufacture 70mm projectors for "Spacearium".

The system employs a single lens to create an audience viewing area of 360 degrees horizontally and 160 degrees vertically to envelope the audience in a picture surrounding it on all sides and above.

iP



HIGHEST SPEED IN PROJECTION

Kollmorgen lenses rate tops in the motion picture industry. Used exclusively with Cinerama, they are standard equipment in more than 70% of American theaters. High light uniformity and less light loss on the screen—the whole screen—are typical of the outstanding performance of SUPER SNAPLITE® lenses.

Other advantages that add up to superior screening with SUPER SNAPLITE are:

- Wire sharp contrast
- Uniform illumination
- Crystal clarity
- Wide range of focal lengths
- Sealed construction

Bulletin 222 describes Kollmorgen lenses in detail. See your equipment dealer, or write us direct.

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EIDOPHOR TV PROJECTOR AS SHOWN AT PHOTOKINA

Demonstrated for the first time at the recent Photokina is the Eidophor, the amazing equipment which projects a live television picture upon a cinema screen. It was to be shown by Philips in their special auditorium, and will be handled in England, on behalf of Philips Electrical Ltd., by J. Frank Brockliss Ltd.

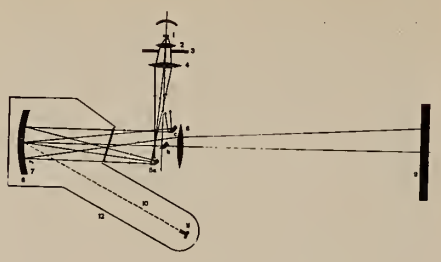


Figure 1

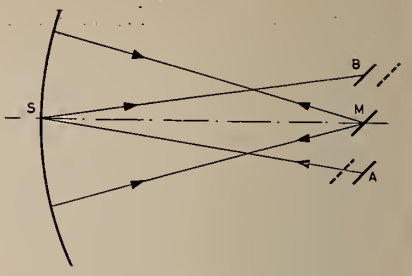


Figure 2

Fig. 1. Arrangement of the Eidophor projector. 1. xenon lamp; 2. condenser lens; 3. picture mask; 4. focussing lens; 5. strip mirror; 6. concave mirror; 7. Eidophor layer; 8. projection lens; 9. picture screen; 10. electron beam; 11. electron gun; 12. vacuum chamber. Fig. 2. Explanatory representation of the "Schlieren" optics.

PRINCIPLE OF EIDOPHOR

The Eidophor is altogether different in principle from all conventional TV reproducers. In effect, the TV image is converted into a moving lantern slide, which by means of a xenon lamp is projected upon the screen. The construction is shown in Figure One.

The functioning of this "moving lantern slide' is based upon the Schlieren optical system, by means of which disturbances such as currents of hot air may be made visible. In the same way, a concave mirror is employed in conjunction with an inclined mirror having a number of slits. In place of the currents of hot air, refraction of the light occurs in a layer of oil 0.1 mm. in thickness, coated upon the concave mirror.

By means of a cathode-ray tube the TV image is formed upon this layer of oil; the varying positive charge in different parts of the image deforms the oil surface, and a varying degree of refraction occurs. As indicated in Figure Two, the inclined mirror is situated at the center of curvature of the concave mirror. Light rays originating at the center of curvature Mare, if they are not refracted, reflected back along the same path and are obstructed by the mirror. Rays originating in A are, if they are not refracted, similarly obstructed at B, and rays originating in B are obstructed at A. Only when a ray of light is refracted by variations in the thickness of the oil layer is it allowed to pass through the slits between the mirror sections, and to reach the screen.

OPTICAL SYSTEM

Reverting to Figure One, the xenon lamp with a dichroic mirror (to reduce heating) and a condenser 2, illuminates the objective slit 3, which by means of a lens 4 is imaged on to the sectioned mirror shown as 5a, b, and c. Light which is refracted and thereby permitted to pass through the slits is focused by the lens 8 upon the screen 9.

The cathode-ray beam 10 from the gun 11 produces the image on the oil layer in the form of an electrostatic charge. The oil layer must be constantly renewed; the arrangement is shown in Figure Four. The mirror rotates slowly,

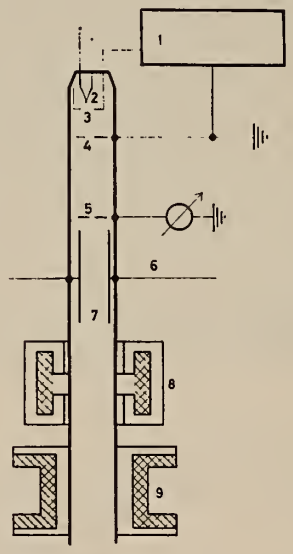


Fig. 4. Arrangement of the cassette with concave mirror, spray scraper, whiper and coil circulation system. Schmitt A-B = section A-B. 1. concave mirror rotating slowly in the direction given by the arrows, with oil layer; 2. television raster in the image field; 3. smoothing wiper; 4. spray scraper; 5. oil filter; 6. oil supply; 7. oil reservoir; 8. oil pump.

and the oil is sparyed by the nozzle 4; the surface is smoothed and the oil kept the prescribed thickness by the wiper 3. Used oil and surplus oil passes back to the oil reservoir 7.

ELECTRONIC SYSTEM

Figure Five shows the electron gun. The effective source of electrons is only 30μ. in diameter; the accelerating voltage is 15 KV, and with best possible focusing the spot on the oil layer has a diameter of only about 50μ. Picture brightness is varied by applying a D.C. voltage to the modulating lens. The cathode has a life of 30 hours, and is replacable.

The electron gun and the concave mirror must naturally be maintained in an evacuated chamber 12, (Figure One) which is readily interchangeable as a whole. The chamber is constantly evacuated during operation by means of a mechanical pre-vacuum backing pump followed by a high-vacuum oil diffusion pump. The equipment is cooled by means of water circulation. The vacuum pump, water circulating pump and heat exchanger are mounted in the lower part of the projector.

PERFORMANCE

The performance of the Eidophor in relation to picture brightness is comparable with that of a modern cinema projector. However, the same standard of definition cannot be expected, due to the line structure of the television image.

At highlight illumination over the whole of the picture area, the projector has an output on the screen of 2000 lumens. Thus on a 25-ft. picture

• BRIGHTER LIGHT
• LONGER BURNING
• SHARPER PICTURE
Free Test Samples

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CARBONS INC., BOONTON, N. J.

• STEADIER LIGHT
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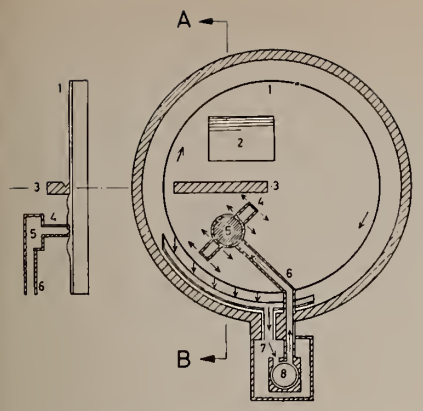


Fig. 5. Diagrammatic section through the electron-beam tube. 1. H.T. and filament supply; 2. hairpin cathode; 3. grid; 4. anode; 5. aperture; 6. video or picture signal; 7. electrostatic modulation lens; 8. focussing coil; 9. deflection coil.

a highlight intensity of 5 footcandles can be produced, and on a screen surface of quite low gain factor the picture brightness would be in keeping with the British standard for screen luminance, which specifies a luminance between 7 and 14 footlamberts. (In comparing these figures it must be remembered that even clear film has a considerable density, so that the equivalent high-light luminance is probably little more than half these figures.)

On a screen having a gain of 1.75 it is possible to produce a picture of acceptable brightness 35 ft. in width.

The Eidophor measures 5 ft. 6 ins. in height and 4 ft. in depth; it weights 800 lbs. A separate rectifier is of course required for the xenon lamp.

iP

Motion Pictures in Indonesia Aid U.S.

Approximately 20 feature-length 35-mm. films were completed in Indonesia in 1960, compared to about 30 in 1959. Shortage of imported raw-stock film continues to be the major cause for the meager output. There are 15,000 to 18,000 employees in the Indonesian film industry, including those engaged in distribution and exhibition of films.

The import quota for the year ending August 31, 1961 has been set at 425 feature films, 10 more than during the previous year.

Censorship is a serious problem in Indonesia. Films considered to contain too much propaganda, violence or passion are banned. Their quota allocations may be replaced by new films if accomplished within 6 months. U.S. companies have experienced censorship problems but have been able to take advantage of their full quota.

There are approximately 750 motion picture theaters in Indonesia with a total seating capacity of about 560,000. All theaters are required to show Indonesian full-length films for one week each month, if available.

iP

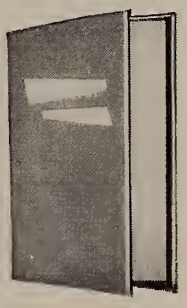
ROY KIRBRIDE DIES

Roy Kirbride, member of the Chicago Moving Picture Machine Operators' Union, Local 110, IATSE, passed away April 11. Services and interment were held in Nashville, Indiana.

iP

Vallen for
CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES
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How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise — how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

ELECTRICAL NOISE

270 pages, 6 x 9
105 illustrations
$10.00

By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
8. Noise Measurements and Techniques
9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
11. Noise in Communication Systems

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Drive Sprocket Booklet

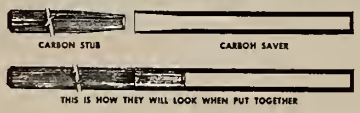
Of special interest to designers, engineers and original equipment manufacturers working with tapes and films actuated by driving perforations is the new Brochure SP-52 just released by LaVezzi Machine Works, 4635 West Lake St., Chicago 44, Illinois.

This informative 8-page bulletin illustrates, diagrams and describes the many different types and sizes of sprockets available from La Vezzi stock and ready for immediate delivery.

Also there is a section devoted to Special Sprockets made to buyer's specifications for those whose requirements are unusual and cannot be met by stock items.

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New Name for SOS

NEW YORK — A new name and trade style has been adopted by S. O. S. Cinema Supply Corp. Established in 1926 as Service On Sound Corp., successive changes were made to Sales on Sound Corp. (1932), S.O.S. Cinema Supply Corp. (1936) and now S.O.S. Photo-Cine-Optics, Inc. The legend of a radio tower and the letters S.O.S. have remained as the company's trademark all this time.

Originally a theatre equipment distributor, so many lines were added through the years that S.O.S. has been described as "The Motion Picture Industry's Department Store". Its customers now number television stations, film producers, motion picture studios, film cutting rooms, TV and commercial animators, special optical effects, art and title photographers, microfilmers, sound recording stages, advertising agencies, educational institutions, non-theatrical organizations, City, State, Federal and Foreign Government Departments.

In the past several years the firm's business has expanded in the fields of ground and airborne photo instrumentation, medical photography, X ray and cinecardiology. S.O.S. has become a primary supplier of motion picture devices for use in Aeronautics, Space and Rocketry Programs. Theatre equipment still accounts for a considerable sales volume, especially overseas. The market for magnetic sound striping machines is also being intensively exploited by S.O.S. at the present time.

S.O.S. Photo-Cine-Optics, Inc. qualifies as a manufacturer, distributor, importer and jobber. Between its Hollywood stocking Branch Office and its headquarters in New York, S.O.S. is ideally situated to cover the entire Industry.

New officers of S.O.S. Photo-Cine-Optics, Inc. are J. A. Tanney, President, W. H. Allen, Vice President, M. E. Tanney, Secretary, D. J. Capano, Treasurer. **iP**

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INSTALLATION

A pair of Norelco Universal 70/35-mm projectors are being installed in Stanley Warner's Allen Theatre in Cleveland, it was announced by Niels Tuxen, general manager of the Motion Picture Equipment Division of North American Philips Company, New York.

The Allen will be the twelfth theatre in Stanley Warner chain to have Norelco 70mm projection equipment. Three other Cleveland theatres, the Palace, Ohio and Stillman theatres have already been exhibiting with 70mm equipment.

Upon completion of the Allen installation, a network of more than 125 United States theatres with Norelco 70mm projectors will be in existence. **iP**



NATIONAL INSTALLATION — Shown with the recently installed powerful National Ventarc Projection Arc Lamp at the new 63rd Street Drive-In Theatre, Kansas City, Missouri, is James J. McGuire, Local 170, IATSE.

Motion Picture Production in Greece

During the film year June 1959 through May 1960, 59 full-length feature films produced in Greece, ten more than during the previous year, Nathan D. Golden, director, scientific instruments, motion picture and photographic products division, Business and Defense Services Administration, U.S. Department of Commerce, reported today. These 59 films were produced by 43 Greek firms and all were based on Greek stories. Eight of these films, considered to be the best, were shown simultaneously in several first-run theaters in Athens and accounted for 43 percent of the total Greek share of theater admissions.

A bill designed to foster the development of the Greek motion picture industry was introduced in the Greek Parliament in January 1961. This legislation would provide for additional taxes on films and the compulsory exhibition of Greek motion pictures. It would also require foreign film companies distributing pictures in Greece to purchase a Greek picture for every five films imported and to use 20 percent of their royalty earnings for the production of motion pictures in Greece. If enacted, this legislation would have an adverse effect on the sale and distribution of foreign films imported into Greece.

During the past year, several United States film production companies have produced feature films in Greece. A large number of Greek extras took part in these films and a large number of Greek technicians and artists were also employed.

As a part of the Greek Government's efforts to promote domestic motion picture production, the first Greek Film Festival was inaugurated in Thessaloniki in September 1960. During the festival 13 Greek feature films were shown to a jury and to full-house audiences. At the conclusion of the festival winners were announced and prizes awarded. The festival is believed to have been unusually successful and will probably be an annual affair in the future.

iP

New Color, New Sound Adds to "Gone With the Wind"

When Metro-Goldwyn-Mayer's "Gone With the Wind" began its new engagement at Loew's State Theatre, audiences saw and heard it as they had never seen or heard it before. The film's breathtaking color photography as well as the sounds of such spectacle scenes as the bombardment of Atlanta have been heightened by today's technical advances.

Improvements in color-film processing and stereophonic sound, made during the past 22 years, have been incorporated in the new prints of the David O. Selznick production.

Although no changes have been made in the film, the addition of stereophonic sounds and the new brillance of the color will give audiences the best possible presentation. iP

H. B. GRIMES DIES

H. B. (Ted) Grimes, 64, sound engineer and member of Local 299, IATSE, Winnipeg, Canada, passed away April 23.

He is survived by his wife Elsie, a married daughter, Kay, and his son, Alex. iP

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. . . Continued from Page 9

screen by panning and tilting the entire projector. Obviously, if the centering is off only a few thousandths of an inch, there is little to be gained from correcting this small error.

If recentering is necessary, replace the aperture, and if one or more of the aperture edges appear inside the masking these edges should be filed. In some cases new aptertures may be required.

The next step is the final adjustment of the working position of the crater with respect to the mirror.

Preceding mirror adjustments centered the mirror on the optical axis and focused its cone of light at the pin hole which was placed one inch from the aperture.

The position of mirror focus for best screen illumination may vary somewhat from the one inch position due to different carbon sizes, type of mirror and working distance. The final adjustment of the crater position should be made by projecting white light on the screen.

Minor adjustment of the crater position should be made to obtain the best overall light distribution and color uniformity. It should not be necessary to adjust the mirror tilt controls as these were adjusted with the alignment tool to center the light beam squarely on the axis.

In theaters having gain type screens and a downward projection angle, the lower portion of the screen will always appear darker as viewed from the booth. This is a necessary condition, if the screen is to appear uniform from the audience's position on the main floor. Therefore, any attempt to adjust for illumination uniformity should be made with an observer on the main floor. On the other hand, matte type screens have the same brightness as seen from any position and the light distribution as seen from the booth will also be seen from all parts of the theater.

iP



Adolph Wertheimer To Head Leading Photographic Firm

The appointment of Adolph Wertheimer to the presidency of Radiant Manufacturing Corp., Merton Grove, Illinois, was announced today by Harry Eller, retiring president.

Radiant, a subsidiary of the United States Hoffman Machinery Corporation, is the world's largest manufacturer of projection screens for home, schol and industry, accounting for 62 per cent of the industry's total volume.



Wertheimer came to Radiant in 1940, one year after its founding, and took complete charge of sales, distribution, merchandising and advertising. He was sales vice president and became executive vice president in 1952. Radiant screens are now distributed throughout the United States, Canada, South America and 59 countries around the globe.

Recognized as an outstanding authority in the photographic industry, Wertheimer had been active in both manufacturing and sales long before coming to Radiant. He owned and operated manufacturing plants in Germany and headed sales for the Albert Specialty Company, manufacturers of photographic equipment.

Eller leaves Radiant to assume the presidency of Panacolor Corp., Los Angeles, marketing a revolutionary new method of printing color motion picture film.

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SPOTLIGHT INSTALLATION — To assure brightest possible illumination of events playing at the Municipal Theatre, Tulsa, Okla., there have been installed two powerful carbon arc Strong low spotlights equipped with an exclusive lens system which eliminates all waste of light. Brilliant spotlighting of all attractions has thus been assured. Shown operating the equipment is Leonard Jack, manager of the theatre, who is also business manager of the Stage Employees Local No. 354.



70MM BOOTH — Shown is John Elrod, Local 228, about to start the use of new Bauer 70 mm. projectors and Strong 35/70 projection arcs just installed at the Pantheon Theatre, Toledo, recently refurbished for presentation of wide gauge film.

L. F. GRANGER PROMOTED

NEW YORK — Laurence F. Granger has been named advertising manager for National Carbon Company, Division of Union Carbide Corporation. Granger has been active in advertising and public relations work with Union Carbide for the past 23 years, and most recently was associated with Union Carbide Metals Company.

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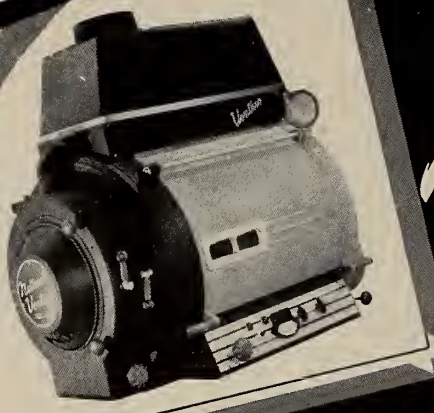
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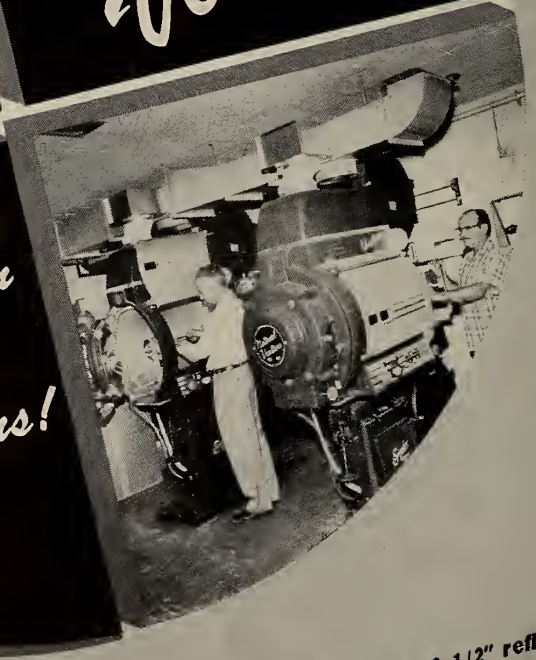
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Volume 36 **June 1961** **No. 6**

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INTERNATIONAL PROJECTIONIST, published monthly by the Internationol Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneopolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizobeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnoy Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rotes: United States, Canada, and U.S. Possessions, $3.00 per yeor (12 issues) and $5.00 for two yeors (24 issues). Foreign countries: $4.00 per year ond $7.00 for two yeors. Changes of oddress should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST ossumes no responsibility for personol opinions oppearing in signed orticles, or for unsolicited orticles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

HERE WE GO AGAIN

"If it isn't on the film, we can't show it."

IP ran a story under that title back in July, 1946. Fifteen years later and we must still reiterate it. The no-talent fringe is still with us and the back-yard producers ranks are growing . . . whenever the equipment is outmoded, the film bad, the light source pre-Edison, the throw excessively steep, the sound coming over like early Vitaphone — whose fault is it? Guess.

This passing-the-buck-to-the-projectionist routine has always been with us, and with the new processes has intensified. (We except those members of the industry who have been giving recognition to the projectionist as an experienced technician, and have taken steps to assist him with new problems. Fortunately, their numbers are growing.)

The major complaints, of course, are light and sound. Some dark screens are due to those black-and-white nonanamorphic projections where the aperture has to be considerably masked to get the wide-screen ratio that is demanded. And the result is not only a dark screen despite high amperages, but cropped heads and feet, titles gone from foreign films, obvious parts missing from standard shots. And a good many of the socalled art pictures, excellent as they may be artistically, seem to have been filmed with the shades drawn. On the other hand, some of the larger color productions have been filmed so light in sections as to make it impossible to keep the balance between intensities. That doesn't stop the complaints to the projectionists to hey, keep some light on the screen, will ya? There is a color extravaganza out now, from one of the big boys, where every change of scene fades in and out with an exposure like your five-year-old gets with an Argus.

When a picture is filmed in magnetic and released and re-released in optical, what are you going to do? Stay on the fader every minute? Projectionists in large first-run houses where such pictures will play for some weeks obtain a familiarity with scenes as they come up to develop a routine on the fader, but what about the house that plays the picture only two or three times? And, as in one theatre we know of, not a thing has been done in the penthouse heads since they were installed years ago, and the magnetic clusters are worn so flat you don't even have to take them out of the reproducers to see the wear. No wonder sometimes in quiet moments the audience can hear some choice language issuing from the projection room.

Some houses have a throw of around 30 degrees, or some have deep stages. This means a steep angle balcony, and a consequent steep-angle throw, and goodbye sharp focus on top and bottom of the screen.

We borrowed some time ago a phrase from one of the experts in the craft: "We licked 3D, CinemaScope, Vista Vision, Todd-AO, Technirama, Camera 65, and all the other new-fangled ideas — and that with no time to learn: 'Here it is —now you show it.' And the projectionist made good."

For every crackpot or legit complain, we could double with instances that show that not only is the projectionist not at fault, but that he had suggested the correct solution. One thing for sure — when the exhibitor has an important technical problem on his mind, he isn't going to ask the popcorn machine.



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INTERNATIONAL PROJECTIONIST

Volume 36 June 1961 Number 6

Why should drive-in projection Be below standard?

If these requisites are followed, and if the equipment, testing and actual picture projection procedures are up to snuff, drive-in projection can be the equal of top-level hardtops. There are also some novel suggestions for atmosphere.

Movies are movies whether shown out-of-doors or in; and if shown out-of-doors, they are expected by the audience to be as dramatically effective as when shown anywhere else. This expectation cannot always be completely fulfilled in drive-in projection any more than it can in the presentation of theatre films over TV; the necessary glamor of the theatre is absent.

But the public expects to encounter at least some true theatrical flavor in the way professional movies are presented in drive-ins, even though they are well aware that TV showings even of memorable old films are no more "glamorous" than they would be if viewed on a moviola.

Even the smallest and most unpretentious of drive-ins—a mere parking lot behind a hot-dog stand in a cow pasture—must not be considered exempt from this important consideration, for when the lights go out and the screen comes to life, the mysterious magic of big-screen movies erases all boundaries of time and space and creates new worlds of mood and feeling. Thus there are no exceptions to any rule of good showmanship.

Good Projection Top Requisite

Lacking elaborate stage (or, rather, screen-area) effect lighting to substitute for curtains (which are out of the question in a drive-in) and without powerful effect projectors to provide pleasing theatrical effects of mobile color during the pre-show and concession-break intervals, very little can be done to supply even a suggestion of theatrical glamor. But however trifling the end result of efforts in this direction may seem by itself, drive-in patrons are certain to respond appreciatively.

All efforts to "glamorize" a motion-picture presentation with theatrical effects go for nothing if the quality of the projection is less than acceptable. Projection quality poses a serious problem in many drive-ins because of the adverse effect upon the sound reproduction of undersize, and often inferior, in-car loudspeakers, and because of the difficulty of adequately illuminating tremendously large screens.

Screen-Brightness Level

The use of drive-in screens exceeding 60 or 70 ft. in width makes it impossible to attain a screen-brightness level of even four foot-lamberts (measured without film, but with the projector shutter running). The minimum acceptable brightness for indoor screens is nine foot-lamberts, a level which only the smallest drive-ins are able to attain.

Low-amperage "simplified" high-intensity arclamps are contraindicated for drive-ins because of their relatively low light output. Acceptable screen illumination can be obtained only with the higher powered H-I lamps having rotating positives. The most powerful modern reflector lamps employing 13.6-mm carbons furnish from 20,000 to about 50,000 screen lumens (measured without the shutter running) depending upon the arc current employed, the effect of positive-carbon cooling, and the optical speed of the mirror and projection lenses.

For the sake of standardization, it is advisable to measure projector lumen-output with regular 0.825″ x 0.600″ apertures and with the projection lens used for non-anamorphic projection, either standard or wide-screen. Heat filters are necessary when the arc current exceeds 75 or 80 amperes unless the new dichroic heat-transmitting reflectors are used. These are now furnished with such high-powered lamps as the Aschraft Super Cinex, the Strong Super 135 and U-H-I lamps, the National Constellation, and the Strong Jetarc.

Measuring Light-Flux

The light-flux, or lumen, output of projectors (often called "screen lumens") is measured with the projector

shutter running because the light intercepted and wasted by the shutter contributes nothing to picture illumination. The output lumens specified by lamp manufacturers, however, represent projector lumens measured without the shutter. This procedure is necessary because the shutters of different projectors transmit different percentages of the total light. For a rough estimate of the actual screen lumens obtainable with a specific make and model of lamp, divide the lamp manufacturer's lumen rating by 2.

Projector light output is one thing; actual picture brightness is another. Although no screen can reflect more light than it receives (drive-in screen reflectivities range from 70 to 95 per cent), it is possible, by using modern "lenticulated" screen panels of specially treated aluminum, to concentrate most of the light into the parking area occupied by the audience. Apparent screen brightness may thus be increased to levels far greater than the maximum obtainable with the best smooth white surfaces.

Lenticulated, or surface-embossed, screens of high reflectivity have the extra advantage of minimizing the effects of extraneous illumination from the sky. Viewed at dusk, before projection begins, such a screen surface looks darker than a white screen. This is as it should be: the function of a directional screen is to direct to the viewing area only the light coming to it from the projectors.

"Skylight" Interference

The problem of skylight is especially troublesome above north latitude 40° during the late spring and early summer months. The sun sets at about half past seven in the northern U.S. at this season of the year, and bright twilight persists for a couple hours thereafter, presenting an obstacle to early starting of the show.

A shadow-box construction of the screen tower has been tried but most tests indicate that wings and alcoves large enough to shield the screen from the sky interfere seriously with audience sight-lines. Viewing angles from the ends of the ramps are often as great as 50°.

Some experts suggest lenticular screens of special design as the best defense against spill light from the sky. Their effectiveness may be just great enough to permit projection to begin about half an hour earlier than when plain white screens are used out-of-doors.

Much depends upon the orientation of the screen, of course; and proposed new drive-ins should be oriented so that the screen faces the east or southeast, never the west or northwest. The picture is imperceptibly faint when the show starts in many west-facing drive-ins, come June and July, as it is usually impracticable to start the show later than 8:30 P.M. (Not to mention the irritations of daylight saving time.)



NEW INSTALLATION — Above is shown an installation of the new set-up of Strong Electric Co. arc spotlights at the Apollo Theatre in New York City.

The magnitude of the twilight problem is suggested by comparing the brightness of the projected-picture highlights on the average drive-in screen (less than one foot-lambert) with the brightness of direct sunlight (12,500 foot-lamberts, more or less, depending on the time of day). The average brightness of full moonlight is only about 0.025 of a foot-lambert, a brightness too low to interfere with projection even when the screen is exposed to direct moonlight. Early-evening twilight may be hundreds, or even thousands of times brighter than direct moonlight.

Optical Efficiency Factors

The optical efficiency of drive-in projection equipment has a tremendously important bearing on the brightness and clarity of the pictures. Not only should the most powerful lamps be used, but also the fastest coated lenses. Fast lenses require the use of modern projector mechanisms because, of course, many of the older machines either cannot accept lenses of large diameter or pass wide light beams without obstruction and consequent vignetting.

Film-flutter and depth-of-focus factors militate against the use of lenses faster than f/2.0 or f/1.9 in conventional theatres where the sharpest images are desired, but lens speeds of f/1.7—f/1.5 provide the brightest pictures with modern high-speed arc-lamps. For the best results, the focal length of the lenses for non-anamorphic projection should not be shorter than 3½ inches or longer than 4½ inches. The exact E.F. (equivalent focus) required depends upon the length of the projection throw and the size of picture wanted.

The "backing," or "prime" lenses for CinemaScope have a focal length somewhat longer than that of the lenses for regular projection. When the E.F. of the lenses for non-anamorphic projection is known, the E.F. for CinemaScope prime lenses which gives the same picture height on the screen may be calculated from the following:

Non-Anamorphic Aspect Ratio	Required E.F. of Lens for CinemaScope
1.375/1	1.192 x non-anam. E.F.
1.66/1	1.439 x non-anam. E.F.
1.75/1	1.517 x non-anam. E.F.
1.85/1	1.605 x non-anam. E.F.

As an example, suppose that you are using 3.75-inch lenses for regular projection at an aspect ratio of 1.85/1 and you wish your CinemaScope pictures to have the same height of image. The CinemaScope prime lenses should therefore have a focal length of 3.75 x 1.605 = 6.02 inches (= 6 inches for practical purposes).

Careful inspection and expert maintenance of the projection and sound equipment is as important in a drive-in as in a regular theatre. And it is only when the equipment has been properly installed and meticulously maintained that those "extras" of projection showmanship which add glamor to the screen presentations may be advantageously considered.

The wide gulf in quality and atmosphere between drive-in and conventional-theatre film presentation can never be completely bridged, but there exist a few areas of operational procedure that permit at least a semblance of "good theatre" in opening the show and providing for the concession breaks.

Consider, first of all, the usual method of lighting the parking area — glaring, unshaded floodlights placed on the top of the screen tower. The lights usually shine directly into the eyes of patrons before the show and during intermissions. The screen, a blank white, is as bleak as an unused billboard; and the overall psychological effect, considered from a theatrical point of view, is bad. Seen for what it really is in the bare essentials of its physical structure, the screen is completely robbed of the air of mystery and glamor it possesses when concealed from view by curtains.

We cannot use curtains in a drive-in, but we can modify the ramp-area

(Continued on Page 17)



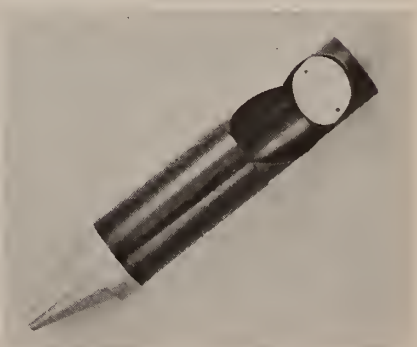
YOUR NATIONAL CARBON ENGINEER...

Sells you the best product—gives you the best service!

The illustration shows a NATIONAL CARBON Sales Engineer using the Motion Picture Research Council's Projector alignment tool to position the mirror on the optical axis of the projection lens.

These Sales Engineers—equipped with complete service kits containing the most modern test equipment—are trained to solve screen lighting problems and help the industry achieve the ultimate in picture quality. This is an important part of NATIONAL CARBON's continuing program of service to the industry.

For best projection results, use "National" projector carbons—for dependable, free technical service, call on NATIONAL CARBON. For details, ask your NATIONAL CARBON supply dealer or write: National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada:* Union Carbide Canada Limited, Toronto.



With the Motion Picture Research Council's projector alignment tool it is possible to determine within a few minutes—while the show is on—if the optical train is in alignment, or what adjustments need be made.

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NATIONAL CARBON COMPANY

UNION CARBIDE

New York Projectionists Asked to Cooperate in Building Flexibility

ELMIRA, N. Y. — The New York State Motion Picture Projectionists were urged to align themselves with professional technical organizations such as the Society of Motion Picture and Television Engineers in an effort to bring about improved projection in theatres.

Addressing the annual meeting of the New York Association of Projectionists, SMPTE president John W. Servies called on projectionists to utilize the facilities of the society to strengthen their pleas for necessary equipments with which to improve theatre projection.

"I urge you," he said, "to take a more active part in the life of the society. Attend more conventions, submit more technical manuscripts, request the support of the society in your efforts to improve theatre projection through the use of latest equipment in good repair."

Citing the volume of technological developments during the last 10 years, Mr. Servies commended the projectionists for "your flexibility in adapting yourselves to the rapidly changing industry in which you are engaged.

"New processes have been installed," he said, "and virtually as soon as projectionists have learned to operate them, they have been replaced by still more advanced designs and the learning process begins again."

This is the way of progress, however, he said, and the standards that could aid projectionists in operating new equipments must necessarily come after these equipments have been installed and are in use.

"I recommend to you," the speaker said, "that in order to make the adaptations that you must as technological progress in the industry continues, that you read technical journals so that you are continually abreast of new developments, and so that when you find yourselves working with these new developments, they will not be totally unfamiliar to you."



JOHN W. SERVIES

President E. F. Larham called the business session to order at 11:45 AM and the following business was brought before the delegates and acted upon. Charles F. Wheeler, the secretary, read a letter from the 25/30 Club asking the endorsement to President Kennedy the appointment of Nathaniel Doragoff for one of the district court positions that will be made in New York State.

This was unanimously carried.

Three recommendations were brought in by the By-Laws Committee which were: To let the 25/30 Club have admittance with two delegates and pay annual dues of $50. To let the secretary-treasurer use all means to raise money that were completely legal and to let him in his judgment pay transportation to both spring and fall meetings if the treasury permits. These last two were accepted. On the question of the 25/30 Club admittance a rather long and lengthy debate followed with most of the delegates talking on the subject. On some questions brought up and some new ones concerning Local 306 of New York City, it was decided to hold over these problems until the fall meeting when the committee could give it more study.

The Ladies Auxiliary gave a donation of $50 which was most welcome and a rising vote of thanks was given the ladies. Steve D'Inzillo of Local 306 stated that if any lady of the Auxiliary is in New York with her husband, if they will contact him, he will see that they have two tickets for the Music Hall. Then the convention was the guests of Local 289 at luncheon.

The afternoon session was under the direction of William Ingram, chief



TRAINING CONFERENCE — Those attending the Stanley Warner training conference at the Century Projector Corp. factory were as follows. Left to right, Michael Chitty, chief engineer and designer of the Century Projector Transistor Sound Systems; Charles Piltz, Stanley Warner, Frank E. Cahill, Jr., vice-president of Century; Phil De Ivernois, Stanley Warner, Robert Giles, Stanley Warner; background, Joe Schmidlin, Stanley Warner; foreground, Ben Perse, Capitol Motion Picture Supply Co., Cy O'Toole, Stanley Warner, and Gio Gagliardi, chief engineer, Stanley Warner Theatres. (See story on page 16 of this issue.)

In the background are the Century 70-35mm projectors and the transistorized multiple channel sound systems.

of the Schine service department and chairman of the educational committee. Our technical session was taped by Harold Potter and this tape will be available for any Local desiring it.

The speakers were Mr. Servies and John Hayes of the Bausch & Lomb Optical Company. These presented another fine technical program to Bill Ingram and his speakers.

Later in the afternoon, the National Theatre Supply Company of New York and Buffalo hosted a cocktail party for all . . . with Jerry George wearing the bartenders apron. During dinner a radio and television were given away, Dick Scott winning the radio and David Babbet of Watertown getting the television.

During the dinner James Naughton of National Carbon Co. was given a gold membership card in the association for the many contributions he and the other National Carbon personell have made. Also thanked was Local 289 and John Krebs.

Utica promises a fine time this Fall (Oct. 16).

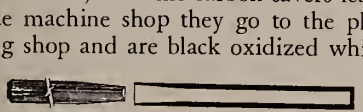
IATSE president Richard Walsh will be there and we all hope to have a large turn-out to help Local 337 celebrate their 50th Anniversary. Mr. Wheeler said Bill Cosby, A. B. West, Jim Naughton and Phil Freeman are contributing to the sustaining membership fund so the Educational program under Bill Ingram can continue.

iP

Walters Announces New Improvements In Carbon Savers

A new automatic screw machine process in making the "Little Miser" carbon saver finishes the saver to precision perfection, according to Lou Walters Projector Repair Service.

Further, after the carbon savers leave the machine shop they go to the plating shop and are black oxidized which



prevents the saver from rust and offers a better electrical contact.

Several thousands of the original "Little Miser" savers have been sold to all parts of the United States and Canada and have met with the approval of projectionists because they do not have to use any tools in order to use the saver and therefore do not get the carbon dust on their clothes and hands. The "Little Miser" saver is for use with rotating type lamps only. Further information can be had by writing International Projectionist or the Lou Walters Repair Service, 8140 Hunnicut Rd., Dallas 28, Texas.

BalCOLD® REFLECTORS STOP FILM BUCKLE

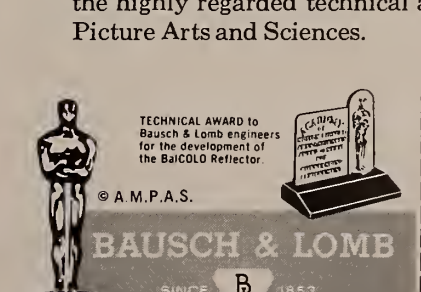
. . . because BalCOLD Reflectors cut heat in half!

BalCOLD Reflectors keep heat away from film, reduce film bulge in the film gate—practically eliminate focus drift. Says one theatre man:

"I mounted 5400 feet of film on an old 3D reel . . . ran a full hour on a single projector without having to refocus once!"

And this same reduction of film heat gives you greater depth of field on your screen. What's more, BalCOLD Reflectors outwear ordinary reflector-and-filter combinations and are lots easier on projectors and film prints.

Next time you replace silvered reflectors, replace them with BalCOLD—the only reflector whose proven contribution to the advancement of motion picture projection has won for its designers the highly regarded technical award from the Academy of Motion Picture Arts and Sciences.



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Versatility and Efficiency: the Joint Keys to Good Performance At New York's Music Hall



JAMES ZOLTOWSKI

The Sound department of New York Radio City Music Hall holds great interest for any who visit there due to its vast equipment and operation. Whether they be technicians or not, the one factor that seems to make the deepest impression on all is the great versatility of the equipment in operation. (Practically all of this equipment is designed, manufactured and serviced by RCA.)

The efficiency of this vastly important phase of the Radio City Music Hall's operation is due to the progressive mind of Warren Jenkins, the sound director, and his able staff of operators.

Neither Stanley Journeay or James Zoltowski, the RCA engineers assigned to the Music Hall, stop their maintenance work in the booth. The stage sound apparatus and various public address systems in the giant Hall are prudently cared for by RCA's "preventive maintenance", as described in the last issue of IP.

The projection booth is as good a place as any to realize the precautions that are taken to present flawless productions. Two complete "RCA PG-143" sound systems are incorporated into a dual channel layout. A brief rundown of the elements in a "PG-143" are as follows: MI 9050 soundheads, monitor amplifier, voltage amplifier, compensator panel, power amplifier, followed by two more power amplifiers in parallel.



SUPERVISORS — Ben Olevsky, chief of projection at the Radio City Music Hall, discusses maintenance of the sound system with Warren Jenkins, the sound director. They are usually aided by the RCA sound service engineers, Jim Zoltowski (top right) and Stanley Journeay.

A flip of a switch means instantaneous channel change. A third channel used mainly for "effects" has been added to the booth racks which can be fed through what is known as the "house speakers". These speakers are independent of the network stage speakers, giving the department another safety device for reaching the audience in case of emergency. Each of the four projectors which were discussed in the previous article has its own exciter lamp supply, featuring both regular D/C and emergency A/C supplies.

As one might expect, maintenance is of prime importance. RCA fills the bill with one of its sound engineers who is on duty four days a week. The purpose, of course, is to prevent unfortunate emergencies. In other words, RCA does not wait for parts to wear out or for tubes to become faulty. Instead they attempt to avoid these occurrences. The RCA engineer's routine consists of machine balance, soundheads and optic checks, exciter lamp and photo-cell efficiency, weekly frequency runs, overload runs, magnetic cluster care, and of course periodic amplifier overhauling. When magnetic prints are in use, a four channel magnetic system which can be controlled on either a regular or emergency channel, are also part of the engineer's maintenance responsibility.

These routine checks are made somewhat easier due to an RCA channel selector device through which either optical or magnetic regular and emergency sound may be fed and monitored. Automatic "dummy load" switching is the big asset here when selecting any of 10 feeds which can be monitored for either testing or booth sound.

Practically all of the sound control console and its sound sources are cus-

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• LONGER BURNING
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tom built for the most professional and flexible sound mixing possible.

At times as many as 100 microphones are in use throughout the theatre. Although handled with care, these microphones need overhauling and replacement parts. This is another of RCA's services. These many sources of sound are fed through individual preamplifiers which are patched and mixed at the console. Sound is then fed through a three channel system which has directional control. This control is governed by seven hidden loudspeakers which can handle as much as 280 watts of audio power.

Seat phones, call systems and intercoms are in constant use and help to make the Music Hall assignment more than routine for the RCA serviceman. Due to the fine co-operation of the projection and sound departments with RCA, most favorable results have been achieved throughout the years.

iP

National Theatre Supply Will Distribute Ampex Theatre Sound Units

SUNNYVALE, CALIF. — National Theatre Supply Co. will act as exclusive national distributor of Ampex theatre sound equipment, according to an announcement by Herbert L. Brown, vice president of Ampex Corporation and manager of Ampex Audio Co. here and Willard J. Turnbull, president of National Theatre Supply Co., Tarrytown, N.Y.

Ampex equipment to be handled by NTS will include an advanced multipurpose theatre sound system for which Ampex recently received a technical award from the Academy of Motion Picture Arts and Sciences. The system is designed to reproduce optical and stereophonic magnetic sound tracks from either 35mm or 70 mm film. The complete circuits necessary for this multi-purpose system are controlled from a single set of push-button selectors, making the system extremely simple and convenient to operate. Previous systems required as many as three sets of controls for optical and stereophonic sound.

Currently installed in over 75 leading theaters from coast to coast, the Ampex sound system was employed in the premieres of "Oklahoma", "Ben Hur" and "Around the World in 80 Days."

The addition of the Ampex line of theatre sound systems rounds out National's line of Simplex sound equipment which it has been distributing for many years, Turnbull said.

National Theatre Supply Co. is a subsidiary of General Precision Equipment Corporation and serves the theatre industry through 25 domestic branch sales offices. Its international division covers the export market with 40 distributors.

iP

New B&L Lens

Bausch & Lomb has designed a 90mm, f/1.0 lens for use in General Electric's new Fluoricon X-ray image intensifier. This unique fluoroscopic system uses mirror magnification, closed-circuit TV, and motion pictures to present X-ray images to the diagnostician. The B&L component, which functions as a relay lens system, is one of the fastest camera lenses made in this country. It picks up the image from a phosphor screen rather than directly from the X-rays, and is designed to photograph in the region of .550 micron light.

The unusual, five-element design of the optical system produces greatly increased light transmission and uniformity of screen illumination.



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IN PROJECTION

Kollmorgen lenses rate tops in the motion picture industry. Used exclusively with Cinerama, they are standard equipment in more than 70% of American theaters. Crystal clarity of projection on the screen—the whole screen—is typical of the outstanding performance of SUPER SNAPLITE® lenses.

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- Fastest lens speeds
- Crystal clarity
- Wire sharp contrast
- Wide range of focal lengths
- Sealed construction



Bulletin 222 describes Kollmorgen lenses in detail. See your equipment dealer, or write us direct.

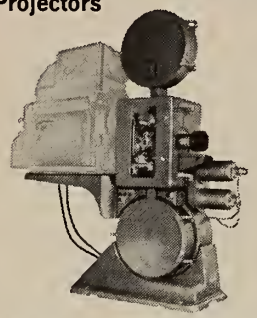
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NORTHAMPTON, MASSACHUSETTS

Question

When is a Drive-in truly modern?

Answer

When it is equipped with Norelco Universal 70/35mm Projectors



Let's put it this way. If you're going to invest in equipment for a new or existing drive-in, shouldn't you protect your investment by choosing equipment that will be up-to-date now and in the years ahead?

The difference between 35mm and 70mm projection is especially apparent at drive-in theatres where huge screens and great distances make it essential to get the maximum amount of light. The Norelco 70mm aperture is larger... allowing 3 or 4 times as much light to pass through. 70mm images are only blown up a fraction as much... providing a far sharper image. And conversions from 70mm to 35mm take less than 4 minutes on the Norelco.

With today's great attractions being released in 70mm and with more and more productions planned for this sized print...the time is not far off when having 70mm equipment is an economic must! Your favorite theatre supply dealer can give you all the facts about Norelco Universal 70/35mm Projectors...the time-tested and proven 70/35 that's used in more theatres than all other makes combined!

See your favorite theatre supply dealer today.

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Motion Picture Equipment Division
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Remodeling, Improvement of Theatres, Projection Facilities, Discussed at SMPTE's Toronto Convention

Many items of interest to projectionists everywhere were discussed at the SMPTE meeting recently in Toronto. Here are the highlights:

The Nathan D. Golden Report shows that 150 feature motion-picture productions were completed by U.S. companies in the first 11 months of 1960, which is down from 170 features for the same period of 1959. However, theater attendance was 44 million (estimated), up from 42 million in 1959, and box-office receipts were higher by 7.5%. The trend is thus for fewer, but larger feature pictures, usually resulting in longer runs at higher admission prices. The total number of theaters in operation in 1960 was 16,-103 (including 4768 drive-ins), compared with 16,354 (including 4063 drive-ins) in 1958. Thus, the trend is toward more drive-ins but fewer indoor theaters. Throughout the world, the total number of theaters increased from 120,000 in 1955 to 155,000 in 1960.

There were 343 feature pictures in the Oscar race in 1960, of which 43% were in color, compared with 38% in color in 1959. Those produced by U.S. companies represented 53% of the 343 total, as compared with 67% in 1959. This trend indicates the growing importance of productions abroad. Growth of the theatrical motion-picture industry during 1960, despite inroads of television, was specifically reported in both Italy and France.

New installations for showing Cinerama pictures in the United States brought the total to 11, compared with a total of 41 throughout the world. A continued increase in theaters for viewing 70mm pictures was noted, the total for the United States and Canada now amounting to 194, including 5 drive-ins.

Another noteworthy trend has been the increasing use of motion pictures for instrumentation and high-speed photography. This was highlighted by the Fifth International Congress on High-Speed Photography, sponsored by the SMPTE and held in Washington, D.C., October 1960. Increasing interest has also been evidenced in the use of motion pictures and television in space technology.

Theater Equipment

There has been a steady but slow increase in the quality of motion-picture projection in the indoor theatres, Also, in the past year, a new spurt of activity in new motion-picture theater construction has evidenced itself.

At least 15 new theaters were built in the United States, mostly in the new large shopping centers. And, according to present plans, it would seem that at least this number of new theaters can be expected to be built in 1961.

A great amount of remodeling of existing motion-picture theaters has also taken place, with new equipment and screens being installed at the same time.

The improvement of lamphouses, giving more and better screen illumination, has led to an almost complete changeover to the pearlescent, comparatively low-gain type of projection screens, with little or no high-gain aluminum-type screens being used. There have also been many screen in-



stallations, especially in new theaters in which the problem of the various aspect ratios was reduced to the adoption of just two shapes.

One of these serves in both size and shape for CinemaScope and 70mm prints using any aspect ratio from 2.2 to 1.

The second format uses the same physical picture height for standard cropped 35mm film, leaving only unused side areas of screen material.

In many cases, in new theaters this has permitted the complete elimination of screen maskings and curtains, allowing the unused side screen areas to be exposed to the audience. The latter condition is especially acceptable in appearance when the walls and ceiling leading to the screen become part of the framing effect of the screen.

These surfaces contiguous to the screen are made to appear in color and light very much the same as the unused screen surfaces, giving a restful and pleasant picture surround effect. This treatment recalls the effect of the RCA SynchroScreen used about 10 years ago, but differs in that it is now built as part of the structure.

The aperture plates, in the projectors have to be specially filed to make it possible to achieve this amount of uniformity in picture format. Very minor picture information is sacrificed in this attempt towards simplification of the problem. The maximum picture widths seem to be 2 W to 2½ W which is in terms of maximum viewing distance divided by picture width.

There are now about 200 installations of 70mm projectors in indoor theaters in the U.S. of both local and foreign manufacture. Only about eight of these are installed in drive-in theaters. It is worthy of note that the portion of the seating pattern nearest the screen changes from an undesirable seating area to a most valuable seating area when 70mm film is projected, because of the marked improvement in picture resolution.

Many motion-picture theaters have been reseated with a decided reduction in capacity to affect more comfortable spacing and seat sizes and to improve viewing angles and distances, all consistent with the newer demands for visual and other physical comforts and the amount of patronage required for business reasons.

Wide-Screen and New Processes

During 1960 no new generally accepted process in wide screen was developed. The use of 70mm presentation increased and many additional projection installations were made throughout the world. Motion pictures released in 70mm during 1960 were "Porgy and Bess," "The Alamo," "Spartacus," and "Exodus."

Paramount Studios began shooting their motion pictures in Panavision 35mm. Panavision, Inc., announced the production of the Panaflex 65mm handheld motion-picture camera. Weighing 24 pounds, the camera has a dual register pin movement, and carries a 500-ft film magazine, tachometer, and parallax correcting optical viewfinder as an accessory.

Nontheatrical Films

New equipments and processes introduced during 1960 made this a noteworthy year for the audio-visual and non-theatrical film fields. Two domestically-manufactured 8mm sound projector models were introduced in addition to those previously announced in Europe. A new type of sound filmstrip projector was also announced. Teaching machines were made available for school use in 1960.

A breakdown of total audio-visual expenditures shows that during 1960 educational institutions spent 32% more than in 1959, reaching an estimated total of $103 million; business and industry spent $184 million; federal, state and local governments, $59

(Continued on Page 16)



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Professional-Type Projectors in Demand for 16mm

By Fred J. Pfeiff, North American Philips Co.

One of the most widely used 16 mm projectors is the Norelco/Philips professional type EL 5000. Fig. 1 illustrates the portable version and Fig. 2 a model intended for permanent installation.

These projectors are designed for heavy duty operation and employ many features usually found only in mechanisms built for wider gauge films. The housings are finely finished castings, eliminating any sheet metal structural parts, and designed for rapid access to the gear train, amplifier, etc.

The portable model utilizes a special 750 watt incandescent with a spherical bulb, an integral reflector and a prefocused base. The lamp, plus the relatively high-speed six element lens (f 1.5) and the unique intermittent movement produces a screen brightness of 10 foot lamberts on a matt white, non-perforated screen measuring 8 ft. by 6 ft.

The incorporated mirror eliminates need for adjustment of an external reflector and eliminates excessive reflection losses by reducing the air-glass transistions. The spherical shape results in more efficient cooling. The filament dimensions are designed for the 16 mm film area, eliminating light losses and aperture heating encountered when a 1000 watt lamp is used. A large aspherical condenser with an aperture of 1:1.3 concentrates a large part of the energy on the film. The luminous flux is 500 lumens.

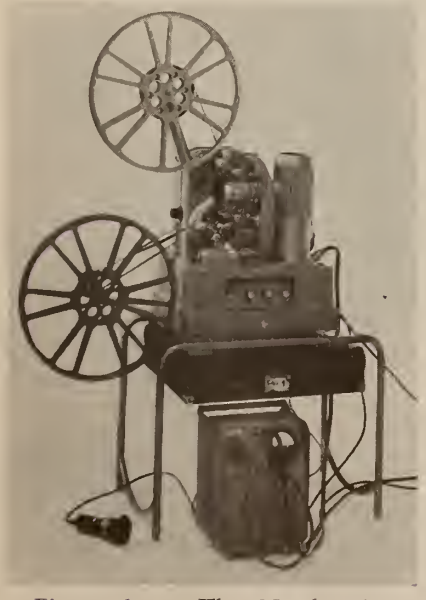


Figure 1 — The Norelco-Philips 16 mm professional projector Type EL 5000 for portable use.



Figure 5 — all illustrations are reduced to the same scale.

Instead of the ordinary claw pull-down, usually found in 16 mm projectors, the Norelco uses a 60° "grooved-disc" intermittent movement and a sprocket with 12 teeth, 6 of which engage the film simultaneously. The movement runs in an oil bath and in manufacture the diameter of the pins is held to a tolerance of one micron. Use of a regular maltese cross with a 90° shifting angle would have limited the sprocket to 4 teeth unless an intermediate gear were introduced between the cross and the sprocket. One result of the Norelco design is an extremely steady picture. Figs. 5-1a and 5-2a illustrate the intermittent.

The fast pull-down action makes it possible to utilize a shutter with the very high efficiency of 72%. It is large diameter, disc-shaped, with two 50° blades and ventilating fins for cooling film and lamp. Air movement is silent with a rather low shutter speed of 1,440 rpm.

A large ball bearing asynchronous motor, without brushes or centrifugal switches, drives the projector through a "V" belt. Double grooved pulleys provide for either 18 or 24 frames/sec. (silent or sound, respectively).

Only four gears are employed. These are of very heavy construction as shown in Fig. 5-3a.

Lubrication is simple. The intermittent oil bath is equipped with a magnetic filter, and only requires oil changes every 100 operating hours.

Reel arms can be supplied for either 2,000 ft. or 4,000 ft. reels, and are equipped with automatic friction devices.

The built-in sound head has a rotary sound drum and pressure roller, designed on the same principle as the well known Norelco 35 mm sound head. All necessary adjustments are provided. Exciter lamps are of the prefocused type. The P.E.C. is the same as that used in the 35 mm sound head. Sound heads for optical sound only, or for both optical and magnetic sound can be provided.

The projector is easy to operate. The entire film path is opened for threading by simply turning one handle. The loops above and below the film gate

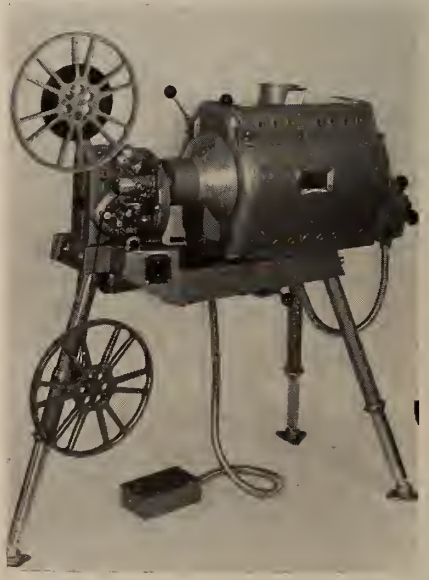


Figure 2 — The Norelco-Philips 16 mm professional projector type EL 5000 for stationary installation.



Figure 3 — Closeup of magnetic-optical soundhead on the Norelco 16 mm projector.

are automatically formed when the film path is closed by turning back the handle. Framing does not change the picture position on the screen. The large diameter sprockets, engaging several sprocket holes simultaneously, allows for operation with damaged film that would often be unfit for ordinary projectors. The film path location is novel. The picture area of the film does not have to be passed over the sprocket teeth when threading, thus film damage is avoided. The components for scanning the sound track become more accessible since the sound track path is on the outer side of the projector.

The film gate pressure is adjustable. The film runner plate position is on the lens holder so that the lens is not thrown out of focus when the holder is opened or closed.

The projection lamp cannot be lit until the motor is started, so overheating of film in the gate cannot occur. Actually, the lamp and motor switches, are in a combined unit.

The built-in amplifier has a high input sensitivity and very low distortion (below 3%) so that weekly modulated tracks can be reproduced at a high level. Volume bass and treble controls are provided. The output stage is push-pull. The P.E.C. polarizing voltage and the exciter supply is provided by the amplifier unit. An emergency A.C. supply for the exciter is included.

The projector with its amplifier is packed into one carrying case that converts into a sturdy base for holding the machine. Included is a metal case with spare parts.

The single loudspeaker carrying case splits into two halves **each** consisting of a loudspeaker and baffle. This case contains connecting cables, rewind and spare reel (see fig. 4).

The stationary model (fig. 2) utilizes the same projector mechanism as does the portable model described above. Instead of the incandescent lamp a 30-35 ampere arc lamp is supplied. The two units are mounted on a base equipped with three adjustable legs. The lamp uses a 10 in. diameter mirror and the shutter housing is equipped with a condenser lens and heat filter. The light output with shutter running, and using the standard lens is approximately 1500 lumens, based on measurements in the center of the screen and a side-to-center distribution of 70%.

With the stationary model an external amplifier is required. Suitable amplifier-speaker combinations are available.

iP

Figure 4 — One half of loudspeaker case for the projector — two are required.



New Kodak Lens Bench Speeds Camera Testing

A new lens bench for rapid electronic testing of photographic lenses was described by William T. Sherwood of Eastman Kodak Company at a meeting of the Society of Photographic Scientists and Engineers in Binghamton, N.Y.

The new machine tests the ability of a lens to concentrate light from the source into a small circular spot at the image, Sherwood said.

The amount of energy concentrated by the lens in a circle of very small diameter is compared with the total amount of light in the image to determine if the lens under test is up to standard. A record of total energy and energy passing through a small circular aperture appear on a cathode ray tube for comparison. **iP**



SMPTE . . .

. . . Continued from Page 13

million; religion, $18 million; civic, social welfare, and recreational organizations, $16 million; medicine, $8 million. The total spent by the entire nontheatrical film field for the year was $389 million.

The estimated number of nontheatrical motion pictures produced in 1960 dropped from the 1959 total of 9340 to 8900. The 16mm sound projector had its greatest sales in ten years —more than 50,000 machines were sold during the year. Taking into account the number of machines con sidered obsolete (15,000) and the number of second-hand projectors sold (13,500), the net gain for domestic use was estimated to be 43,500, not including 5500 exported. The total number of projectors in use as of January 1, 1961, was estimated at 727,000.

The introduction of the Fairchild Cinephonic 8mm camera (Fig. 36) and sound projector (Fig. 37) and the Eastman Kodak Sound 8mm (Fig. 38) projectors marked the beginning of a new era in motion-picture projection.

In nontheatrical motion-picture circles the subject of 8mm sound film and projectors has been the most discussed topic in many years. By the end of the year, numerous research projects and experimental uses involving 8 mm sound film were underway.

A recent development of Kalart Co. employs a new approach to sound slide-film (sound filmstrip) projection. The filmstrip operates on the principle of having every other frame contain the sound which is scanned simultaneously with the projection of an adjacent picture frame. The amount of sound per frame is limited to a maximum of 18 seconds.

iP



Century Conference

Stanley Warner Theatre Corp. engineers and supervisory personnel attended a training conference at the Century Projector Corporation factory on the new transistor sound systems being installed in a number of their theatres including the Allen Theatre in Cleveland, Ohio which will open soon with 70mm projection and the new Century multiple channel (6-4-1) transistorized sound system. (See Page 8)

The training conference was conducted by Gio Gagliardi chief engineer of Stanley Warner Theatres and included the operation and service of the complete projection and sound systems being installed.

iP

COLE CHANGES NAME

Albert Cole, president, today, made public the fact that Cole Products Corporation, Chicago, manufacturers of beverage vending machines, will henceforth be known as Cole Vending Industries, Inc.

Cole made a particular point of clarifying the reason for the change. The old name, according to Cole, is too general and not descriptive of Cole's new role in the vending industry.

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SYRACUSE ADDITION — This Strong Trouper spotlight has joined the ranks in the projection room at the Paramount Theatre in Syracuse, N.Y., according to a recent announcement from the Strong Electric Co., Toledo, Ohio.

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DRIVE-IN PROJECTION . . .

. . . Continued from Page 6

illumination facilities as the first all-important step in providing a substitute for the conventional curtains.

Color-Lighting the Screen

With the general lighting removed from the audience-facing screen tower, and with the screen surface kept reasonably dark when the parking area is illuminated, means for decoratively color-lighting the screen may then be planned and installed. It is only necessary to provide screen-tower floodlights with a battery of color floods directed down upon the screen surface and shaded by metal shields in such a way that relatively narrow, but slightly overlapping, beams are thrown down upon the screen itself.

Six is the minimum number of tower lights of this type which will give the most glowing color effects. These should be fitted with glass theatrical filters in light-tight metal boxes. The suggested colors are primary red, green, and blue, twice repeated in that order:

R, G, B, R, G, B,

to provide the proper mixture colors where the beams overlap. An array of brilliant, gradually merged hues is thus produced in each overlap area—scarlet, orange, yellow, and chartreuse in the regions jointly illuminated by the red and green beams; aquamarine, turquoise, and azure in the green-blue overlap; and indigo, violet, purple, and magenta in the blue-red overlap.

Another spectacular arrangement of six lights duplicates the rainbow spectrum, the filter colors being, in order, red, orange, yellow, green, blue, and violet. The rainbow effect is most pleasing when produced symmetrically with twelve lights, the last six reversing the order of the first six:
V, B, G, Y, O, R, R, O, Y, G, B, V.

When just the three primary colors are used, the precise hue of each filter is a matter of critical importance. The red should be an intense, very deep red, not a scarlet. The green should be a rich green, not a pale green and neither yellowish nor bluish. The blue must be a deep, clear blue having neither the greenish tinge of cyan nor the violet tinge of ultramarine or indigo.

The chromatic intensity of the colors produced by additive mixture is so great when fairly pure primary filters are used, audiences regard the display as unforgettably striking. But for the full effect to be obtained, the flood-

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Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

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light bulbs must be very high-powered, and the screen must otherwise be dark.

Footlighting, Other Effects

Because the colored beams become less intense toward the bottom of the screen, the "top lighting" should be supplemented by footlighting which, for the most striking effect, should be entirely of one brilliant color, preferably red or rose (magenta). Of course, the order can be reversed, with the overlapping multicolored beams shooting up on the screen from the bottom to meet a flood of clear blue across the top.

An additional effective touch of color may be provided, where expense is no objection, by a neon-tube surround for the entire gigantic screen. The color should not be too glaring—blue if red bottom-lighting is used, or rose-pink if blue top-lighting is chosen.

If an effect spotlight or powerful carbon-arc stereopticon is available, a color-effect slide made by splattering a plain cover glass over its entire surface with transparent colored slide inks will enable extremely beautiful effects to be produced by color addition with the floodlighting. A dual slide "dissolving" stereo projector multiplies the possibilities for spectacular display. Any colored scenery projected upon the screen to emulate a theatrical backdrop should be produced by skilfully handpainted slides, not by Kodachromes. The gelatine of photographic emulsions is apt to blister upon prolonged exposure to the intense heat of the projecting lantern.

Beautiful effects can be created with nothing more than the multicolor tower lights and footlights described in the foregoing. If separate electrical circuits are provided for the tower lights, the three primary colors can be used individually to build up the opening of the show.

The green floods (visually the brightest) can be on when the first patrons arrive. In bright twilight these will produce little more than small spots of green luminescence at the top of the screen. As it grows darker, however, the green areas will seem to become brighter, and extend farther down, a cue for filling the remaining areas with red, blue, and all the mixture colors which they automatically form.

Special Showtime Theme

A specially selected overture theme may be placed upon the phonograph turntable 2½ or 3 minutes before show time; and the moment this begins to play, the red or rose footlights should be switched on to provide a spectacular flood of color which ascends from the bottom of the screen to meet the vertical bars of color coming down from the top.

The overture record played at show-opening time should have a character different from that of the preceding interlude music, and be played every night for two weeks, or even a full month, before it is replaced by a different selection of the same general type. The show-opening music, by being more "theatrical" than a run-of-the-mill hit of the day, and by being played at the opening of every performance (and at no other time) "cues" the audience to prepare itself for the immediately ensuing screen entertainment.

The music of the special overture should be emotionally dramatic in a "relaxing," rather than an "exciting," way, but it should never be of a depressing nature.

A semi-symphonic or concert-style instrumental rendition of a memorable musical-comedy melody, a nostalgic "standard," a special arrangement of movie theme music, mood music in tempo and with a clear-cut melody, or even jazz in the style of Mantovani, Kostelanetz, and their imitators—any of these is good for the purpose.

Use of Commercial Records

Best of all, perhaps is the powerful music of the theatre pipe-organ. This type of music, popular, standard, or semi-classical, is played on orchestral pipe-organs of the kind installed in large theatres, not on "electronic organs," which have neither the pleasing tonal quality nor the romantic expressiveness of "the mightiest of instruments." Theatre-organ music may be found on 78 rpm or LP 33⅓ rpm records.

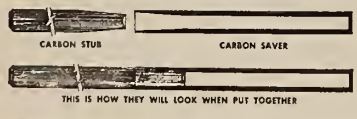
If it be remembered that the overture music played at opening time is to set the stage dramatically by a change of pace and tonality, and yet be completely pleasing to the large majority of the audience, then not too much difficulty in its selection will be experienced.

While the color-lighting effects may be repeated at the concession breaks, it is advisable not to play the show-opening overture record again, but use a different selection of the same general type to resume projection.

As one will most readily appreciate, the color-lighting routine, perhaps more gaudy than indoor-theatre effect lighting, substitutes for the grand drape and title curtains which are not available in any drive-in for a truly theatrical type of opening. It is by painting the screen with a rainbow-gamut of glowing color that the bareness of the drive-in is subdued, and at least a hint created of the glamor which can be found and experienced only in the theatre.

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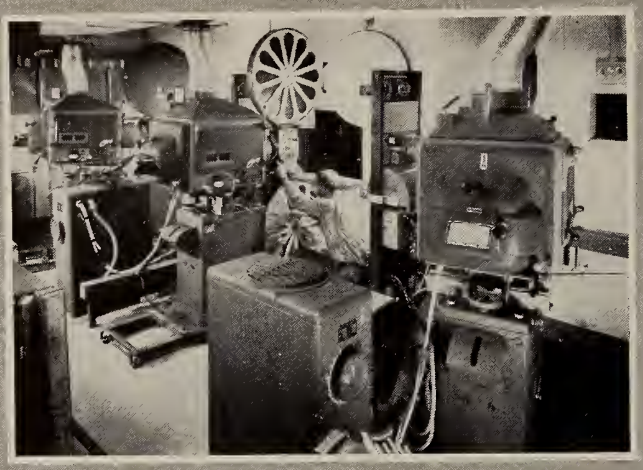
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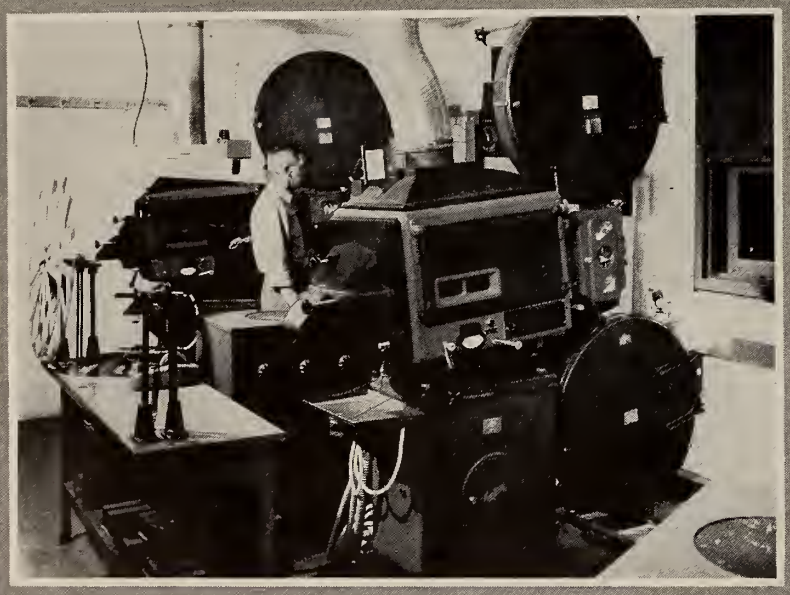
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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

EQUIPMENT DEALER SERVICE

Some years ago an exhibitor group was interested in a move to buy its equipment direct from the manufacturer. Nothing came of it, but if the experiment had gone through the exhibitors would have found that it was costing them plenty to escape, as they thought, the equipment dealer's commission on the merchandise they bought for their houses.

Indeed, that dodge had been tried by a large circuit which was not long in abandoning the dodge to cut out the dealer's profit, for it was soon found that the individual theatres in the circuit were spending more for service men and installations of the equipment than the home office was getting by cutting out the dealer's commission.

The well established dealer is a service firm which satisfies the theatre customer with all the man-hours of skilled labor for installing the machines and making them function properly as per the guarantee.

The average projectionist is well aware of the reputable equipment dealer's beneficial function to the movie theatre. It's too bad that many of the projectionists' bosses, the theatre owners, haven't learned that lesson of the trade.

The projectionist working with a good dealer firm can contribute much to the theatre's presentations, solving their mutual problems and sharing their know-how about projection, sound and electrical devices and the accessory equipment which makes for good presentations of motion pictures.

The bulk of theatre equipment manufacturers depend on their dealers to sell, install and service their products in theatres in sections around this country and abroad. These manufacturers don't put their products in a dealer's line unless they are satisfied of the dealer's integrity, honest performance of his servicing and his know-how about the particular product.

We pity the projectionist whose boss doesn't like to part with money he thinks is the reputable equipment dealer's "discount" on the cost of the merchandise from the manufacturer; the boss who is ever wanting to get it "wholesale." That kind of theatre owner usually is out a lot of money in inferior merchandise, or if it is perfectly good equipment but sloppily installed, it cannot function efficiently.

What the projectionist can do in such circumstance, other than try to educate his boss to the economic facts of the trade, is a tough problem.

The current complicated apparatus for projection and sound has made the equipment dealer's service more important than ever in the theatre industry. Actually, the theatre equipment dealer sells service as well as merchandise, and the theatre industry couldn't flourish, couldn't operate, without this important cog in the whole complex of the motion picture industry.

Most of the equipment dealers look on themselves as part of the film industry and they find an affinity with the projectionist whether his boss gives his trade to them or buys elsewhere. So the craftsman in the booth should have no hesitancy in making friends with the dealer-firm's staff of salesmen or technical men, whether his theatre is a large, or small or no customer at all of the most reputable dealer in his district.

Who knows whether this friendly acquaintance between the projectionist and the best dealer in the area may result in better equipment to work with in his theatre job?

(Continued on Page 18)

INTERNATIONAL PROJECTIONIST

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New Long Island Showcase: Glen Cove's Town Theatre

Its fame has spread in industry circles as a model suburban motion picture showcase, with superior projection, sound presentation.

By THOMAS C. KENNEDY

The Town Theatre, Glen Cove, Long Island, opened last January, and its fame not only as a model for a suburban movie showcase but as well for its very superior projection and sound has spread to far places in the industry (particularly in the case of out-of-town theatre men who visit New York City and are told about the Town by fellow exhibitors, projectionists and equipment dealers).

The theatre's reputation for its projection, sound, curtain and screen masking precision installations is well deserved, for it is an ideal setup, and once again shows the wisdom of theatre owners in having a head projectionist work with the architect, the builder and the equipment dealer who installs the booth equipment.

Andrew Marglin, chief projectionist of the Town, was engaged by Town and Country Theatres — a circuit which operates four theatres in towns on Long Island — when the project was started. He designed the projection room and supervised the installation of the equipment which Capitol Motion Picture Supply Co. of New York supplied. Capitol's Peter Braut, with Marglin, supervised the booth and screen installations.

The Town, which caters to "the carriage trade" — many large estates surround the Glen Cove north shore area — as well as townspeople, is unique in many ways.

The projection room (inside dimensions 18 by 18 ft.) is centered in the mezzanine floor, and it's flanked by 76 seats that sell for $2.00 nightly — they're hard-ticket reserved seats on weekends. The booth is of double-wall construction, with an air space between them, and acoustically insulated outside and inside so no sound from the booth can be heard in the mezzanine or auditorium.

Two Century Projector Corp. 70-35mm projectors can show "flat" or CinemaScope or 70mm prints. The projectors are fully water cooled. A Century multiple channel transistor sound system carries the sound. The arc lamps are Ashcraft Super Cinex high intensity lamps with Balcold reflectors. Capitol also supplied the Bausch & Lomb lenses for 70 and 35mm projection; the Neumade rewind booth equipment, and the Hurley Super Optica screen — which measures 20 by 48 ft. — and the Mulone adjustable pipe screen frame.

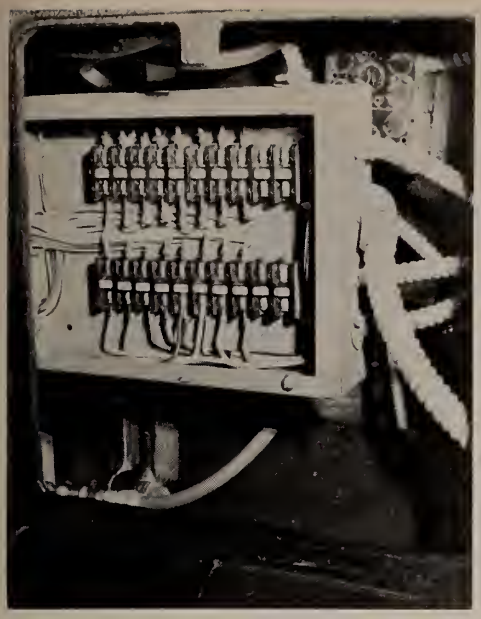
The amplifiers are Altec 1568A and have an emergency channel which automatically picks up if any one of the regular channels fail. Five RCA speakers are behind the screen, with auditorium speakers for stereo.

The curtain and masking, the latter designed by Andy Marglin, are con-



Photograph by Larry Dovee, Century Projector Corp.

As technically correct inside as it is handsome outside, the Town Theatre, Glen Cove, L.I., is a product of projectionists working hand in hand with architect, owner, and equipment firms.



Terminal board connections are used throughout, with color coding and terminal board speaker connections so that any unit can be checked quickly from the projection room.



Rectifiers are housed in a separate soundproofed room, with complete remote control of both regular and emergency functions from the projection booth. The construction care to provide good quarters for both men and equipment is shown here.

trolled from the booth with push buttons mounted on the front wall between the projectors, and work smoothly and instantly in changing from "flat" to CinemaScope to 70mm — for the latter most of the area of the screen is used.

Backstage speakers are mounted on a special 11 ft. high steel platform providing excellent audibility to all seats.

Rectifiers are housed in a separate soundproof room, with complete remote control of normal and emergency functions from booth.

All projection wiring is through the base on terminal board connecting devices. All booth wiring is color coded and labeled. Booth is serviced with 200 ampere three-phase service. Booth proper has 24-circuit safety breaker panel. All speaker connections are brought to terminal board in booth so that any unit can be checked or substituted without delay.

The reference to the Town's booth setup as "ideal," is not only due to the superior equipment, its insulation against noise filtering to the auditorium, but such other factors as a water cooling system for the projectors that is automatic. If the automatic system fails there's an alarm — a buzzer — and the projectionist on duty turns a valve to bypass the regulatory water cooling system.

In addition to the arc lamp vents, there are two vents in the room to bypass air to outside the theatre and a ceiling vent for supplying air conditioning to the booth from the theatre's plant.

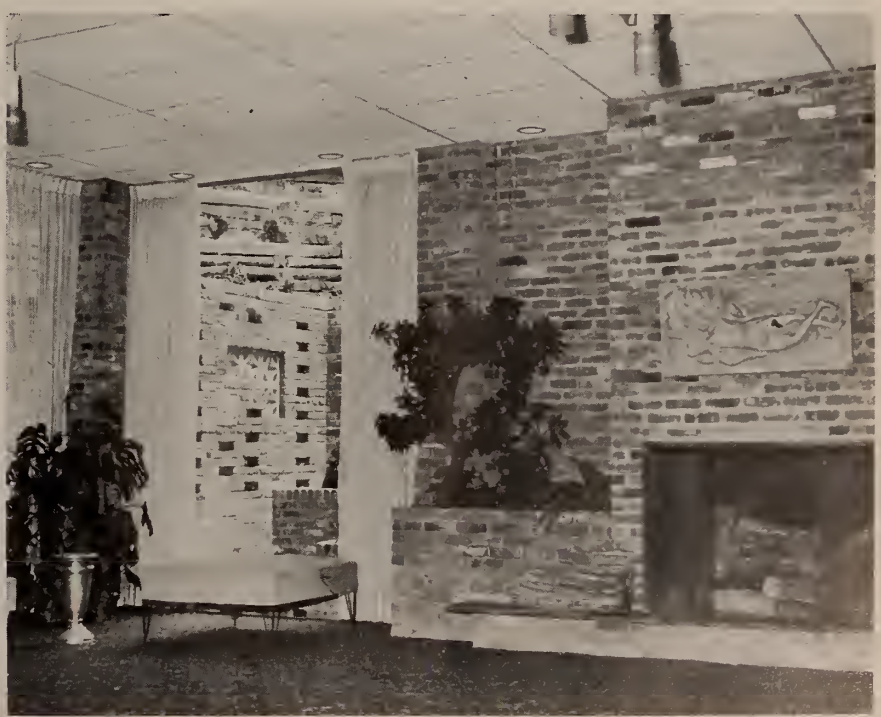
The Town Theatre is constructed of stone, brick and glass — the latter opens the view from the theatre front to the foyer, the lobby and gives light to the capacious lobby, which runs to the depth of the auditorium. Entrance to the auditorium is immediately to the left of the ticket-taker's box.

The auditorium is done in brick and stone, matching the facade of the theatre, with fluted panelling about mid-way up from the floor to the ceiling, painted in off-white, and extending to the proscenium.

The architect for the Town was Leon Miller; the builder was Ira Miller, brother of the architect.

Town and Country Theatres was formed less than three years ago by Sidney Sinetar and Sy Frank, and the circuit operates two theatres in Glen Cove. The Glen Cove is about 300 yards from the Town and both theatres front on the main street. The two theatres have a common parking lot which accommodates 600 cars. Henry Carlsen is

(Continued on Page 14)



The exterior and interior of the Town Theatre are tied together artistically; the foyer is more of a reception area than a theatre lobby, with the fireplace, plants, and large windows shown here.

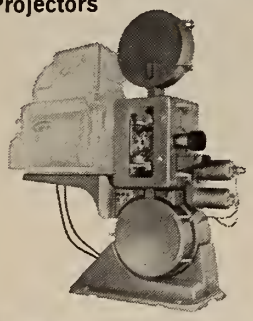
Photographs by Ray Escorcio, Local 640

Question

When is a Drive-in truly modern?

Answer

When it is equipped with NORELCO Universal 70/35mm Projectors



Let's put it this way. If you're going to invest in equipment for a new or existing drive-in, shouldn't you protect your investment by choosing equipment that will be up-to-date now and in the years ahead?

The difference between 35mm and 70mm projection is especially apparent at drive-in theatres where huge screens and great distances make it essential to get the maximum amount of light. The NORELCO 70mm aperture is larger... allowing 3 or 4 times as much light to pass through. 70mm images are only blown up a fraction as much... providing a far sharper image. And conversions from 70mm to 35mm take less than 4 minutes on the NORELCO.

With today's great attractions being released in 70mm and with more and more productions planned for this sized print... the time is not far off when having 70mm equipment is an economic must! Your favorite theatre supply dealer can give you all the facts about NORELCO Universal 70/35mm Projectors... the time-tested and proven 70/35 that's used in more theatres than all other makes combined!

See your favorite theatre supply dealer today.

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SMPTE Produces New Motion Picture Sound Reproduction Test Film for ASA

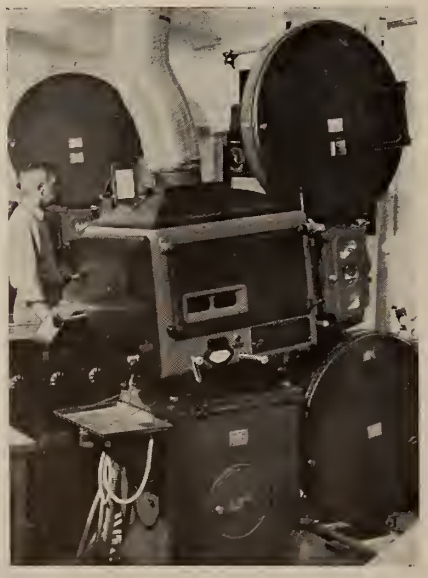
NEW YORK — Theatre owners, projectionists and acoustical engineers now have a revised American Standard citing a test film for qualitatively checking and adjusting 35mm motion picture sound reproducers and judging the acoustical properties of auditoriums.

Approved by the American Standards Assn. as "American Standard Theatre Sound Test Film for 35mm Motion Picture Sound Reproducing Systems, PH22.60-1959," the new standard is a revision of one approved in 1948. Now, it specifies a 35mm film which may be used to determine sound reproduction and the efficiency of acoustical systems. The test film contains samples from studio feature pictures and examples of typical release-print material intended to provide a check on reproduction. This includes volume range, frequency response, system noise, power-handling capacity and flutter.

A 500-foot test film made in accordance with the American Standard has been produced by the Society of Motion Picture and Television Engineers, the administrative sponsor of the project.

The availability of five other revised standards relating to motion pictures was also announced by the ASA. Titles of the other standards are: "Reel Spindles for 16mm Motion Picture Projectors, PH22.50-1960," "Method of Determining Transmission Density of Motion Picture Films, PH22.27-1960," "1,000-Cycle Balancing Test Film for 35mm Motion Picture Sound Reproducers, PH22.67-1960," "9 Kilocycle Sound Focusing Test Film for 35mm Motion Picture Sound Reproducers, PH22.62-1960," and "Cross-Modulation Tests for 16mm Variable-Area Photographic Sound Prints, PH22.52-1960."

Copies of these standards are available from the American Standards Assoc., 10 E. 40th St., New York 16, N. Y. **iP**



GRAND GETS CINERAMA — Shown is Thomas W. Wright in the recent single booth installation for Cinerama at the RKO Grand, Columbus, Ohio. Included in the equipment are Strong projection arc lamps.

Carl Cooper, IATSE V.P., Heart Victim on Coast

LOS ANGELES — Carl G. Cooper, second vice-president of the International Alliance of Theatrical Stage Employes and Moving Picture Machine Operators, died suddenly and unexpectedly of a heart attack at his home here.

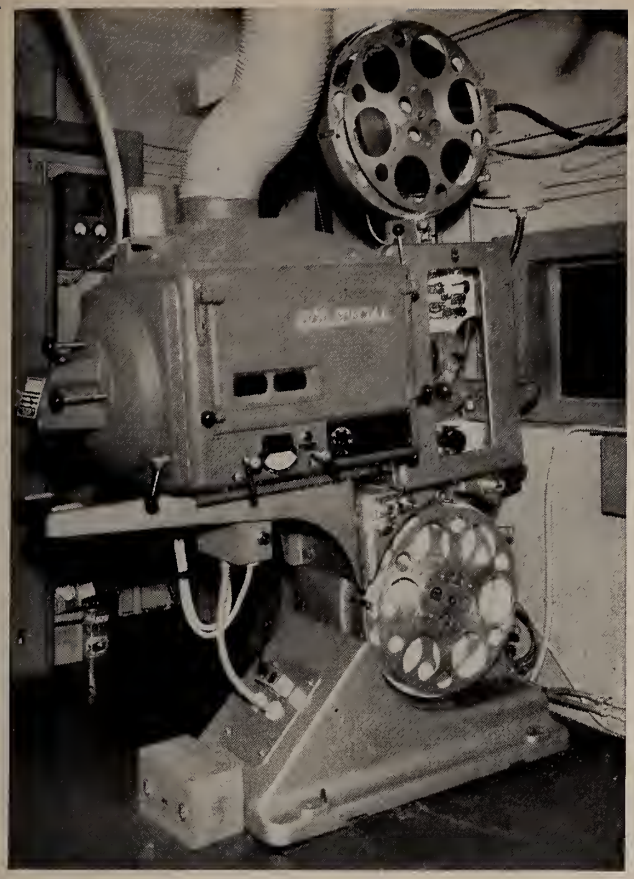
He was business agent of Los Angeles Stage Employes local 33 and a member of Hollywood Studio Grips local 80. He also handled many vital studio assignments for international president Richard F. Walsh.

Born and raised on a farm Cooper went to work for a theatre at Indianola, Iowa, at the age of 13. He moved west in 1907, graduated from high school in San Diego in 1909 and became a member of Stage Employes local 122. He was business agent at San Diego from 1911 until 1913 and then went on the road for the next 14 years, last five on the record-breaking run of "Abie's Irish Rose". In 1919, he transferred to Los Angeles Local 33. He served as chairman of that local's board of directors from 1928 until 1934, when he became Business Agent. He was elected an international vice-president in 1942. He was a member also of the board of directors of the Los Angeles Central Labor Council, AFL-CIO. **iP**

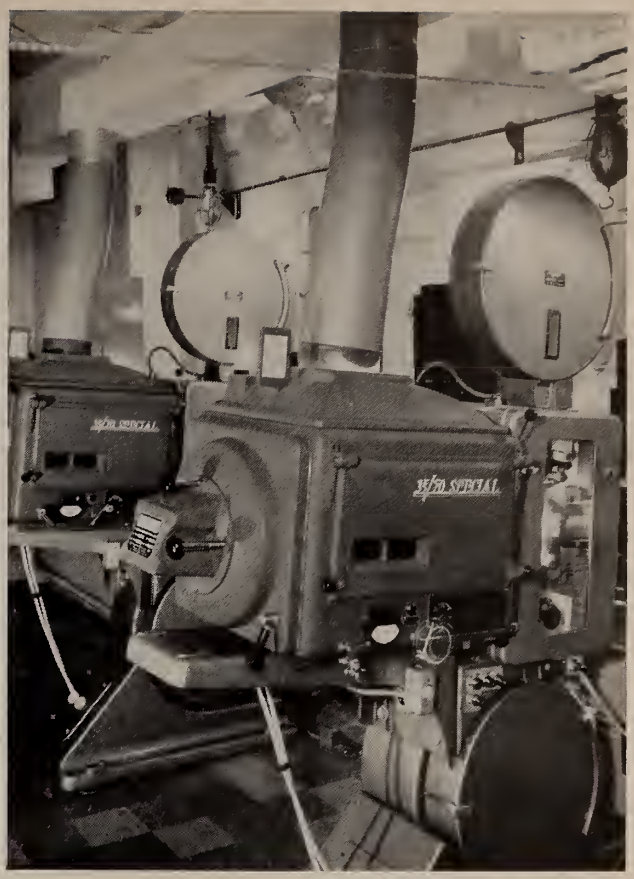
New Zealanders Elect

AUCKLAND, N. Z. — Election of officers of the Auckland (New Zealand) Motion Picture Projectionists was announced here by Doug Harley, president.

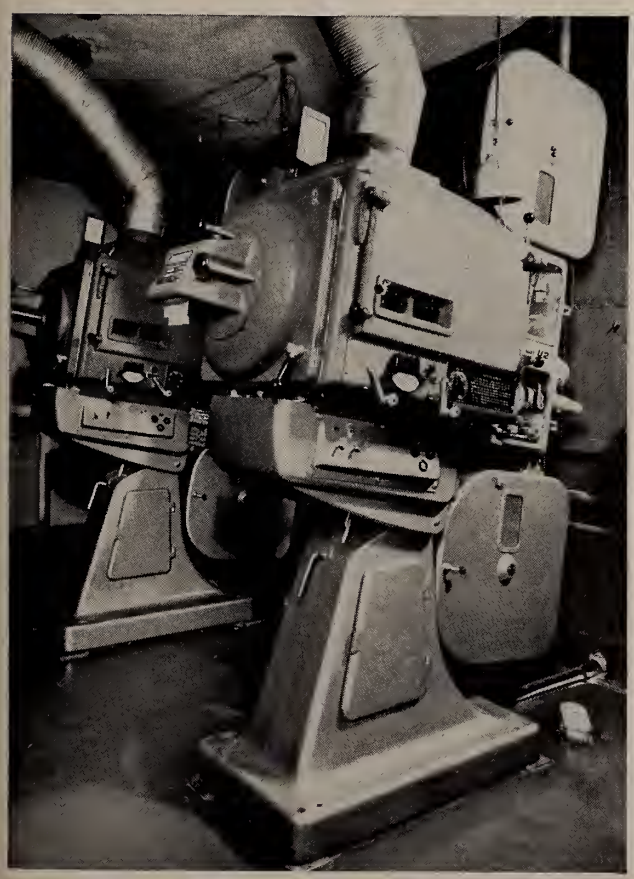
Elected were A. Mouldey and A. Simmons, vice presidents, and R. Davern, E. Wansbone and L. Ward, executive officers. N. Finch continues as secretary. The Auckland projectionists unit is one of five in the New Zealand Federation of Motion Picture Projectionists and is affiliated with the New Zealand Federation of Labor. **iP**



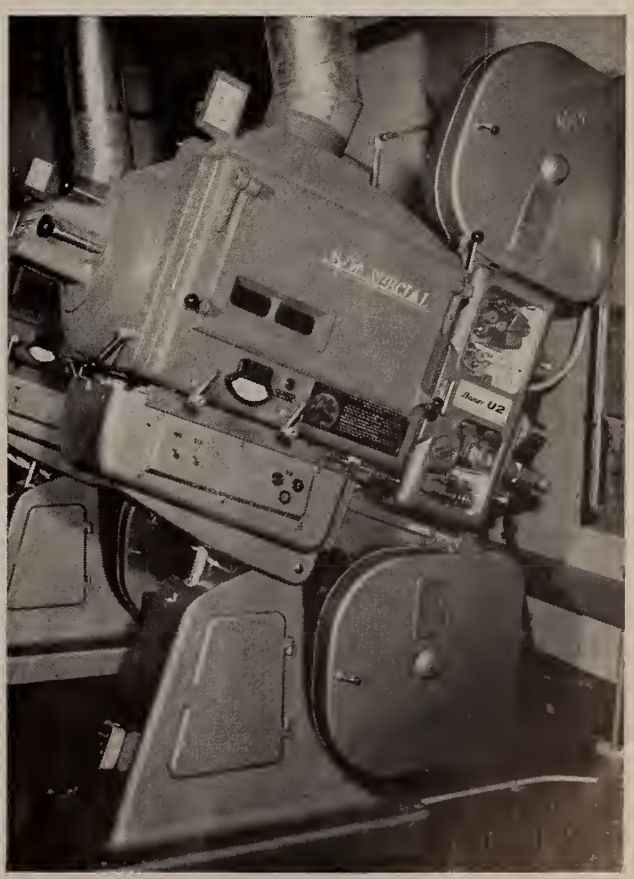
FOR FINEST, LOW COST 70/35 PROJECTION



THEY INSTALL 35/70 SPECIAL ARC LAMPS



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ABOUT A CONVINCING DEMONSTRATION NOW

Equipment Memo:

You Want to Project a Good Picture? Proper Screen Selection, Servicing Is a Must

(First of Two Articles)

Professional golfers have been known to slug their way around a course with nothing more than a single club in their bag — on a bet or a dare, of course — but when the chips are down in tournament play they "load for bear" with the best and most specialized equipment available.

A muslin sheet stretched taut on an oaken frame was plenty good enough for the nickelodeons half a century ago, but who uses muslin today when there is a wide assortment of textures and surfaces from which to choose? Projectionists and theatre owner share the obligation of selecting the screen which best fits the need of the theatre — four-wall or sky-top — in which it is to be used.

A good screen suited to the shape and size of the auditorium and to the prevailing projection angle is a prime consideration in any theatre. The screen should be regarded as a principal component of the projection system, and not as a mere incidental. "Any old sheet" will not do, for even the best projectors, lamps, and lenses are wasted upon an unsuitable or imperfect screen.

Beaded screens are not favored at the present time; neither are the old coarse-textured, extremely high-gain aluminum screens which look spotty and grainy, and produce fadeaway at the bottom of the picture when viewed from the balcony, or fadeaway at one side when viewed from the opposite side. The use of low-and-medium-gain aluminum screens of modern manufacture should be confined to long, narrow theatres. The lenticulated aluminum screen is perhaps the most satisfactory metalized screen.

The function of motion picture screens is twofold. A screen provides a flat blank surface upon which the picture is projected, highly magnified and in sharp focus and it transmits or reflects the light it receives into the viewing area occupied by the audience. The surface must be fine-grain and uniform, and it must reflect (or transmit) the maximum amount of light, distributing it evenly over the viewing area.

The overall, or integrated, reflective power of good screens is high. A matte or pearlized screen, for example, is dazzling white in color. Ordinary white paper reflects 50 or 60% of the light falling upon it, but a perforated matte (white) screen of minimum acceptable quality reflects 70%. In fact, a reflective power of from 80 to 85% is usual for modern perforated matte screens, while solid, or non-perforated, screens reflect 90% of the light or even a little more.

There are several distinctly different types of screens. The two main classes of screens are the reflective and the transmissive. Because transmissive screens require the projectors to be placed behind them, forming the projected picture by the transmission of light through the thin, translucent, semi-diffusing material of which they are made, such screens are used for rear-projection purposes in motion-picture and television studios. Transmissive screens are only seldom used in theatres, and appear unsuited to the wide-angle requirements of CinemaScope.

Conventional reflective screens, as their name implies, reflect the projected light to the eyes of the audience. They must do this with an absolute minimum of light-loss and distortion, and without altering the relative photographic densities of the light and dark areas constituting the picture. And in the case of color-film projection, the screen must not introduce color of its own by absorbing some colors more than others. In other words, a serviceable screen must be colorless or snow-white.

The class of reflective screens may be divided into two large groups, depending upon surface ad light-reflecting characteristics. Tese are the diffusive and the specular types, with gradations between them. Diffusive reflective screens are known in the trade as "white," or "matte," screens; and because these screens have the best light-distributing properties and the finest, detail-revealing surfaces with the most uniform light-reflecting characteristics, they remain the universal standard for theatre projection. Only in the most recent times has a better type of screen appeared.

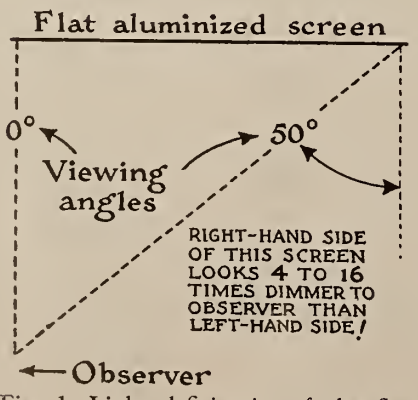


Fig. 1. Light deficiencies of the flat aluminized screen for the observer seated well to the side.

Specular, or directional, screens are represented by the "metalized" (aluminum-painted) and "beaded" types. Each of these, when correctly used, reflects most of the light directly into the audience area, but the reflection characteristics of the two are quite different.

A theatre screen subtends a large viewing angle, hence different parts of a screen are observed at different angels by each patron. If the screen is of the metalized type, some areas will look considerably brighter than other parts.

For observers in the middle of the auditorium, fadeaway at the sides of a flat high-gain aluminum screen will be excessive. Patrons in the balcony will see a picture brighter at the top than at the bottom. For patrons seated at one side, as shown in **Fig. 1,** the picture will look annoyingly dark on the opposite side.

Aluminized screens should not be used in wide theatres or for wide screen projection in any theatre.

Aluminized screens reflect mirror wise, that is, at an angle equal to, but opposite, the angle of projection. Such screens work best where there is a moderate downward projection angle. They are unsuited to drive-ins where the projectors tilt upward. If used in drive-ins having steep upward projection angles, aluminum screens throw most of the light up into the sky!

Beaded screens have reflection characteristics too "peaky" to make them satisfactory in theatres. Patrons in the middle of the auditorium see an excessively bright picture, while those in the side seats are literally robbed of projection light. And unlike metalized

screens, glass-bead and resingrain screens reflect most of the light back toward the source — the projectors. This peculiar characteristic makes beaded screens unfit for use in theatres having steep projection angles.

Attempts to compensate for the directional errors of specular screens by physically tilting the screen are not approved. With the possible exception of specular screens in certain drive-ins, all theatre screens should be positioned plumb and parallel to the rows of seats (or to the chords of the rows when the rows are slightly curved).

Aluminum and beaded specular screens are often called "high-gain" screens because the apparent reflectivity of these screens, when viewed from the center of the auditorium, is from 1½ to 5 times the maximum 100% reflectivity of a theoretically perfect diffusive screen.

Figure 2 illustrates the light-reflecting characteristics of non-perforated theoretically perfect screens. As shown, a perfectly reflecting and diffusing matte screen (dotted line) has at all viewing angles a reflectance of 1 (a reflectivity of 100%). The perfect specular or lenticular screen having a complete light-cutoff beyond 60 degrees (solid line) has a reflectance of 1.57 through a 120-degree viewing angle. The perfect directional screen cutting off beyond 40 degrees, funneling all light into an 80-degree reflectance angle, has a uniform reflectance of 2.2 (broken, or "dot-and-dash," line).

Although perfect screens having these marvelous characteristics exist only in the imagination, modern screens of the matte, pearlized, and lenticular types approach these optimum performance characteristics and give brighter, clearer, more evenly lighted pictures than old-style screens.

Apparent reflectivities of 150%-500% are produced by directional properties which necessarily rob the side viewing areas of light. Light cannot be created by a screen; and the overall, or integrated, reflectivity of any screen never exceeds 100% (a reflectance of 1). Whereas a perforated matte screen furnishes an apparent reflectance of 0.80 to 0.85 at a viewing angle of 50 degrees, perforated aluminum screens have reflectances of only 0.2 to 0.4 at this angle.

Figure 3 diagrams the reflectance of perforated low- and high-gain aluminum screens contrasted with that of a perforated white matte screen of good quality.

The "peaky" characteristics of the high-gain screen (3.9 reflectance at center, 0.2 at 50 degrees) precludes its use in any but the longest, narrowest theatres. The low-gain screen has a reflectance of 2.1 at the center and 0.4 at 50 degrees. Even this screen is too directional for widescreen projection.

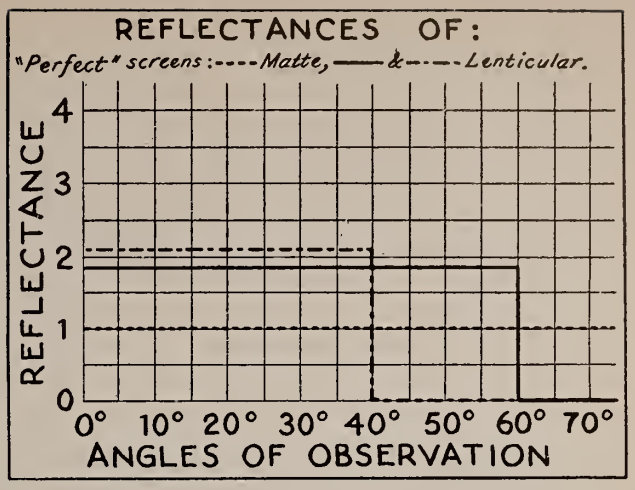


Fig. 2. The light-reflecting characteristics of theoretically perfect non-perforated screens.

Pictures projected upon aluminized screens sometimes look mottled, and they nearly always look grainy in highlight areas. This undesirable specular property of metalized screens, together with their low overall reflectance, induces quality-conscious theatre owners to select screens of other types for efficient and pictorially perfect projection.

Due to the technical ingenuity and deep appreciation of theatre-projection conditions by American screen manufacturers, however, new types of aluminized screens having improved light-distributing characteristics are now available. These more diffusive specular screens reflect light more uniformly over larger angles, and are suitable for use in theatres too wide for the old-style "peaky" aluminum screens. A distinction is thus made between high-gain and low-gain metalized screens.

The new semi-directional aluminum screens lie midway in light-reflecting properties between the old strongly directional metalized screen and the white matte surfaces which are undeniably superior as regards the projection results they are capable of giving. Matte screens provide the highest degree of light distribution, a minimum of fadeaway, the best photographic resolution, and the truest color rendition. To find a better screen than a plain white screen, we must look to those marvels of modern screen engineering — the pearlized and lenticular types of screen.

Smooth pearlized screens are only slightly directional (center reflectance 1.5), and the reflection peak is broad. Even at the most extreme viewing angles, plain pearl screens are practically as bright as the best matte screens. So satisfactory are pearl screens in nearly every type of theatre, that we can confidently state that pearlized screen surfaces, both smooth and "lenticular," are the very best obtainable.

Presented in **Fig. 4** are the reflectance curves of one unsatisfactory and two satisfactory types of screens. The beaded screen is much too "peaky" to be useful (4.3 reflectance at center, 0.45 at 50 degrees). This is shown by the "dot-dashed" line. Moreover, beaded screens often fog fine pictorial detail and may be irreparably damaged by cleaning.

The pearlized and matte perforated screens, on the other hand, have some-

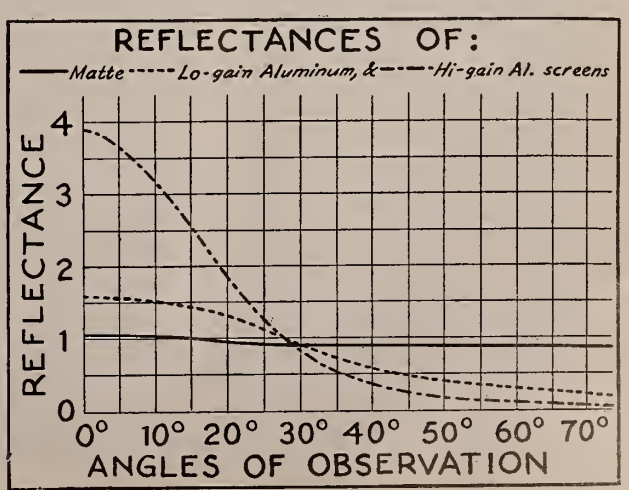


Fig. 3. Reflectance characteristics of perforated low- and high-gain aluminum screens contrasted with the performance of a good quality perforated white matte screen.

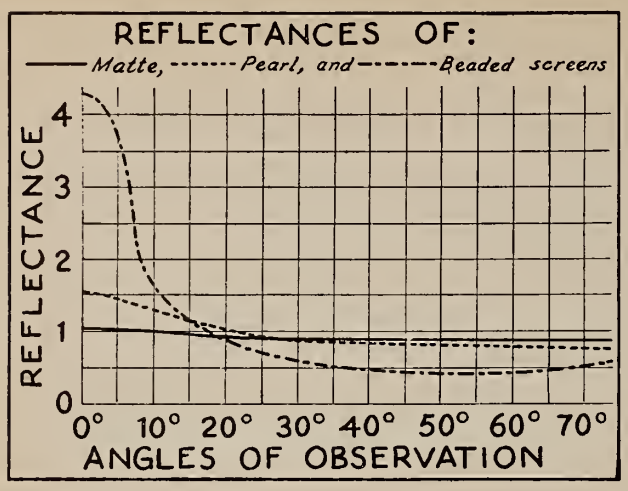


Fig. 4. Reflectance characteristics of one unsatisfactory and two satisfactory screens. Note that the beaded screen (dot-dash) is too "peaky."

what higher overall reflectances and more uniform surfaces which can stand repeated cleanings. The white matte screen, being almost perfectly diffusive, has practically the same apparent brightness at all viewing angles (0.85 reflectance shown by the solid line). The pearl screen, indicated by the dotted line, is only slightly directional. It has a reflectance of 1.5 at the center and 0.8 at 50 degrees. Pearl screens are somewhat superior to matte screens.

Both matte and pearlized screens give superb projection results and are highly recommended. Beaded screens, never satisfactory, are tabu in theatres having steep projection angles because they throw most of the light back in the direction from which it came.

The so-called lenticular screen is a newcomer to the group of screens intermediate between the specular and matte types. The light-distributing characteristics of lenticular screens are modified by tiny cuplike depressions, or lenticules, embossed into the plastic material of which these screens are commonly made. They are available in both pearl and aluminum surfaces; and, of the two, the pearl has the higher overall reflectance and the most uniform degree of reflection over wide viewing angles. The aluminum-surfaced lenticular screen, while definitely superior to plain aluminum screens, exhibits a reflection "peak" with a side-viewing fadeaway which becomes excessive beyond 55 degrees.

The light-distributing characteristics of pearl-lenticular screens, together with the high degree of definition and contract imparted by them to the projected pictures, make them extremely desirable for projection of the highest quality in theatres of every type. They combine all the good characteristics of matte screens with the exceptionally high and uniform reflection of light obtained by scientific screen engineering. It has been adequately demonstrated, by test and by actual theatre use, that pearl-lenticular screens are superior to all other types of screen.

Perforated pearl-lenticular screens have a center reflectance of about 1.6 with no appreciable falloff up to 30 degrees. Reflectance is 1.1 at a 50-degree viewing angle, 1.0 at 55 degrees, and 0.8 at 60 degrees. Good modern matte screens have a center reflectance of 1 with a falloff to 0.9 at 30 degrees, and to 0.8 at 70 degrees.

Reflectances at various viewing angles of perforated lenticular screens are shown in Fig. 5, the dotted line indicating the pearlized, and the dot-dashed line, the aluminized, screen. The reflectance curve of a perforated matte screen (solid line) is included for comparison.

These curves indicate that both types of lenticular screen give a brighter picture than the matte screen over the main angles of viewing. The pearl-lenticular screen, however, provides uniform brightness from the center to an angle of 30 or 35 degrees (reflectance of 1.6), whereas the aluminum-lenticular screen, having a center reflectance of nearly 2, decreases in brightness to the level of the pearl-lenticular screen (1.6) at 12 degrees, and to the level of the matte screen (0.85) at 48 degrees. The pearl-lenticular screen does not become less bright than the matte except at angles greater than 60 degrees.

The pearlized lenticular screen, a comparatively recent development, represents one of the best type of screen surface available for theatre use. It gives a beautiful picture and is unexcelled for widescreen projection in auditoriums of all shapes and sizes, and regardless of the prevailing projection angle.

Which screens, because of their excellent performance, are favored? The white matte screen is standard and gives results which, for color rendition and for clarity and contrast of image, can be equalled only by more modern screens of special types, notably the pearl and lenticulated pearl. The pearlized screens give the same beautiful picture that a matte screen does, but provide greater brillance to make the picture more vivid, more lifelike. The plain pearlized screen, therefore, is somewhat superior to the matte screen, while the pearl-lenticular screen is by far the best screen of all.

Curved screens should not be used because they distort the geometry of the picture, especially where moderate to steep projection angles exist. Special processes such as Cinerama, Todd-AO (70-mm film), Thrillarama, Cinemiracle, etc. employ curved screens to suggest a "surrounding" of the audience by a panoramic field of view and to maintain the same projection distance at all points on the extra-wide screens. Screen curvature is justified in these special processes because, as a rule, steep projection angles are avoided and because of the "novelty" quality of the projection. Standard projection even at the higher aspect ratios does not, and should not, duplicate special conditions which, however spectacular and interesting, are clearly unsuited to the main function of the theatrical motion picture — the telling of a story. **iP**

(Next Issue: Care of Screens)

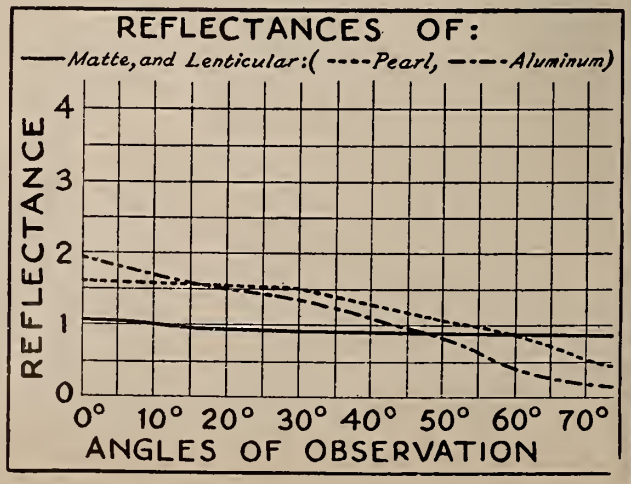


Fig. 5. Performances of perforated lenticular screens as compared with that of a perforated matte screen. The pearl stays brighter than the matte until after viewing angles of over 60 degrees.



STAGE SPOTLIGHT — Additionol projection booth equipment of the Southern Colifornio Gas Co., Los Angeles, includes o follow spotlight for providing brilliant lighting of all live presentotions on stoge of the ouditorium. Shown with the equipment is C. B. Lee. Equipment supplied is Strong Electric of Toledo, Ohio.

Century in Ampex Tie-up

NEW YORK — Motion picture exhibitors should use courage and inspiration in their plans for theatre modernization, Larry Davee, president of Century Projector Corp., said here.

Davee's statement accompanied the announcement that Century has concluded arrangements for an exclusive dealership of Ampex magnetic clusters and magnetic sound reproducers for 70mm six-channel or 35mm four or single channel replacements.

"The combination of the finest magnetic pick-ups, sound reproducers and the improved quality of the Century all-transistorized amplication systems, insures the motion picture theatre owner and the projectionist the advantages of single or multiple channel magnetic reproduction with more insurance and safety against failure than was ever possible even with single channel optical reproduction," Davee said.

Davee added that the new arrangement could stimulate a growing interest in multiple channel hi-fi stereophonic theatre sound reproduction which would compete more adequately with home stereo sound.

"One thing is certain," Davee said. "Unless the motion picture industry provides professional projection and sound reproduction to compete with TV and home entertainment, we can safely predict a further recession in theatre business.

"Now is the time for courage and inspiration to modernize all motion picture theatres, using new and modern methods of presentation. Now is the time to merchandise the theatre as well as the picture. The key to better customer relations is to provide professional entertainment available through no other medium." **iP**

Brodsky to S.O.S. Photo

NEW YORK — Lt. Col. Harry Brodsky, USAF Res., has joined forces with S.O.S. Photo-Cine-Optics Inc., it was announced here.

Brodsky brings with him a varied background in both still and cine photography, an experience which goes back to his military service, where he shot detailed aerial assignments from over 20,000 ft. Since active duty he has served in the commercial field as both photographer and production consultant. For the past five years Brodsky was associated with Mark Shaw Studios in New York. While there he acquired a knowledge of the equipment he will now be handling, especially those items needed on location.

Brodsky's primary duties at S.O.S. Photo-Cine-Optics Inc. will be to supervise their newly expanded rental and leasing department. The company's policy of providing technical assistance and consultation for the problems encountered by film producers, TV stations, sound stages, film laboratories, animation studios and advertising agencies will also be handled by him. **iP**



CRYSTAL
CLARITY
IN PROJECTION

Kollmorgen lenses rate tops in the motion picture industry. Used exclusively with Cinerama, they are standard equipment in more than 70% of American theaters. Crystal clarity of projection on the screen—the whole screen—is typical of the outstanding performance of SUPER SNAPLITE® lenses.

Other advantages that add up to superior screening with SUPER SNAPLITE are:

- Fastest lens speeds
- Crystal clarity
- Wire sharp contrast
- Wide range of focal lengths
- Sealed construction

Bulletin 222 describes Kollmorgen lenses in detail. See your equipment dealer, or write us direct.

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iP AUDIO-VISUAL

Sun No Bar to Film Projection With New Method

CHICAGO — Sun-bright natural illumination in the classroom or in a commercial establishment need no longer be a deterrent to the use of filmstrips or motion pictures, according to officials of the H. Wilson Corp. (of Chicago), developers of Wilson "RP" movie-mover.

Previously, Wilson officials said, rear projection unit worked only with 16 mm projectors, but the development of a special wide angle lens made it possible to work with all popular makes of filmstrip projectors.

More effective use of films in the classroom and in business is being uncovered every day. One sales-minded firm gives prospects an immediate demonstration via films right in a lighted showroom. A flick of a switch shows a motion picture without bothering to pull down the shades. Participating executives can take notes and hold face to face discussions.

The "RP" unit goes anywhere on smooth rolling 4″ ball bearing casters. Screen size is equal to a 30″ TV set and provides clear, sharp pictures for groups up to fifty persons.

Cost is $139.50 or $159.50 plus cost of a wide angle lens. No special projector is required. The "RP" unit is virtually unbreakable and has no moving parts.

iP



AUDIO VISUAL coordinotor John Troutmon of Midlothion school, Midlothion, Ill., uses a Wilson "RP" unit and film strip projector developed by the H. Wilson Corp. of Chicogo.

New Victor Projector

PLAINVILLE, CONN. — Victor Animatograph Corp., a division of Kalart, has announced a new 16mm silent projector for athletic coaches and time-study engineers which features a remote control forward-and-reverse switch and rheostat control for operating the projector at a range of 10 frames per second to 27 frames per second.

The Kalart Victor Model 70-0 is the only silent projector which can accommodate a full 1600 or 2000 ft. reel. This new model includes the improved quiet mechanism of the Kalart Victor Model 70 sound projectors, designed for trouble-free maintenance. It also includes special optical glass heat filters as standard equipment to permit projection of brilliant still pictures without danger of overheating the film. **iP**

Missile-Firing Aid

ROCHESTER, N. Y. — A 25mm, f/2.0 projection lens, designed and manufactured by Bausch & Lomb, is currently being supplied to Melpar, Inc. for a unique projection system which screens aerial film on a 13-foot spherical surface, simulating the actual flight conditions of a military jet plane. The pilot watches the film while manipulating mock controls for both plane and missile guidance apparatus. The mounting diameter of the lens is 2-25/32 inches, and visual resolution is about 150 lines per mm on axis.

iP

New Transistor Text Published

"Design Manual for Transistor Circuits" by John M. Carroll, managing editor, Electronics, McGraw-Hill Publishing Co. 376 pp. plus index; 28 illustrations; 8⅜ x 11; McGraw-Hill; $9.50.

"Design Manual for Transistor Circuits" was compiled to help the engineer in designing circuits using transistor and other semiconductor devices. It contains a review of basic transistor and semiconductor theory, and discusses the use of transistors in basic circuits such as amplifiers, oscillators, power supplies, and pulse circuits. There is also material on the application of transistors in equipment such as home entertainment and communications apparatus, instruments, and computers. In addition, the book includes articles dealing with basic transistor circuit design philosophy, design charts, and nomographs. Applications of newest devices such as tunnel diodes, silicon controlled rectifiers and unijunction transistors are also covered.

Advances made in semiconductors during the last three years are stressed and there are many useful circuit diagrams detailing up-to-date designs and applications.

John M. Carroll is managing editor of Electronics magazine. A graduate of Lehigh University (BS in engineering) and Hofstra College (MA in physics), Carroll spent five years in navy electronics and one year with the National Bureau of Standards. He is the author of several other McGraw-Hill books, among them "Transistor Circuits and Applications" and "Modern Transistor Circuits."

Further information on Carroll's "Design Manual for Transistor Circuits" may be obtained from the McGraw-Hill Book Information Service, 327 West 41st St., New York 36, N, Y.

iP

Alden SMPTE Engineer

NEW YORK — Alex E. Alden of Stamford, Conn., has been appointed staff engineer of the Society of Motion Picture and Television Engineers, it was announced here by SMPTE executive secretary Charles S. Stodter. Alden replaces J. Howard Schumacher.

Prior to joining SMPTE, Alden was associated with 20th Century-Fox Film Corp. for 15 years. As a research engineer in the division of research and development, he was engaged in the design and development of special optical and mechanical equipment for use in the motion picture studio and laboratory, under the guidance of motion picture pioneer, Earl Sponable. **iP**

NEW RESEARCH FACILITY

ROCHESTER, N. Y. — The new, modern seven-story physics research building of the Eastman Kodak Co. here is virtually complete and is now occupied by 200 members of the Kodak research laboratories staff.

The structure contains over 200,000 square feet of floor space. There are over 200 special rooms where research will be carried on in such fields as theory of the photographic process, optical systems, sound recording, and solid state physics. **iP**

Kalvar "Heat" Process a Potential For Film Industry Application?

CULVER CITY, CALIF. — Projectionists in the future may be running film, at least positive prints, by a new photographic system which does not require chemical processing; heat develops the photo image.

The Kalvar process, originally developed for microfilm, has some potentials for motion picture and TV prints. Metro-Goldwyn-Mayer has bought into the Kalvar Corp. and a division of the company, called Metro-Kalvar Inc., is experimenting at Metro's Culver City studios with those potentials of the new photographic system for the motion picture and TV industry.

Glen G. Magnuson, executive vice president of Kalvar Corp., said during his presentation of "The Kalvar Story" at a recent meeting of the New York section of SMPTE, that Kalvar has no present plans to develop cameras, either motion picture or still, so original motion picture negative by the process is a long way in the future.

Polymer chemistry is indirectly responsible for the development of the Kalvar process. Kalvar uses Du Pont mylar for its process whose image formation is by light scattering rather than by light absorption, as with chemical processing in the dark room.

For its Kalfax microfilm process Kalvar states that while Kalfax raw stock is approximately 2c per foot more than silver print film, it is possible to save more than 2c per foot on labor, chemicals, equipment depreciation and overhead.

The mylar film is not of itself light-sensitive, has an emulsion of a light-sensitive diazo compound. On exposure to the proper light source the suspended diazo particles of Kalfax microfilm are decomposed into a dye residue and a gas. The gas bubbles set up a minute pressure center in the plastic, the film is then developed by heat at about 255° F.

After the film has been exposed, the Kalvar emulsion makes contact with a heated cylinder, the heat developing the film and a visible image has been created. Kalfax film, like silver film, undergoes three processing stages: exposure, development and fixing. The first two stages are automatic. The fixing of the positive print is by strong light, to de-sensitize the unexposed portion of the film, and then kept for a few hours at temperatures below 110°.

The Kalfax printer-processor is a very simple, portable device. And prints positives at a speed of 5 feet per minute. There are two spindles for the negative and positive at top and bottom of the printer with a series of idler rollers bringing them together at the heating element. The finished positive and negative going separate ways to spools at top and bottom on the right side of the device.

Of course, like most big corporations, Metro-Goldwyn-Mayer is diversifying, and its buy into Kalvar Corp. may, or may not result in any application of the process to the motion picture and TV industry. However, the MGM studio has its technical research department, headed by Douglas Shearer, working on the process.

iP

Stanley-Warner Buys Century Multi-Channel Transistor Systems

NEW YORK — Century Projector Corp. has announced the sale of the Century projector 70/35mm multi-channel transistor sound systems to Stanley Warner Theatres. The systems purchased were designed and engineered to specifications prepared by Gio Gagliardi, chief engineer for Stanley Warner.

The Century multiple channel transistor program consists of six channel magnetic, four channel magnetic and single optical sound. Facilities for a third projector are also included. These facilities provide for six channel magnetic, four channel magnetic or single optical as the case may be.

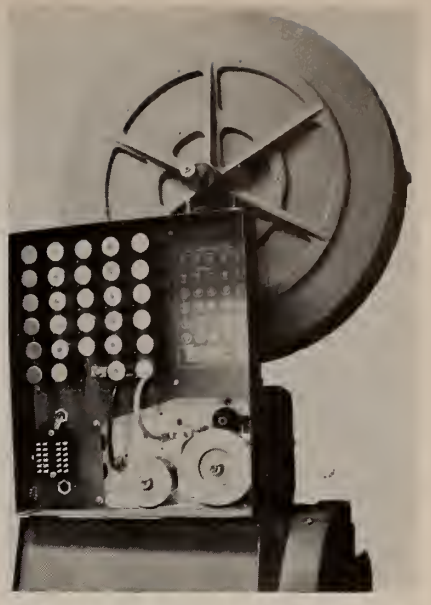
The new systems have been engineered for high reliability, high fidelity and extremely simple installation. Due to the space saving small size of the transistor units, low level amplification up to zero level, electronic changeover and six, four or one track pre-select circuits are housed on each projector.

A small junction box adjacent to the projector run is used to connect the audio out-puts of 2 or 3 projectors to the power amplifier in-puts and also houses the lamp and transistor power supplies. The junction box also conveniently serves as a non-sync switching station with microphone, phono or tape in-puts.

No mechanical relays are used and all electronic units including power supplies and equalizers are plug-in. All amplifiers are small round cans three inches long and are marked and color coded.

The Century systems are flexible in every respect. Interchangeable features heretofore unheard of in vacuum tube amplification systems are employed. Because of the unique transistor design, maintenance overhead is greatly minimized.

iP



TRANSISTOR SOUND SYSTEM — Stanley Warner Theatres has purchased Century Projector Corp. multi-channel transistor sound systems of the type shown above. (Photo by Larry Davee of Century.)

GFL FILM OUTPUT UP

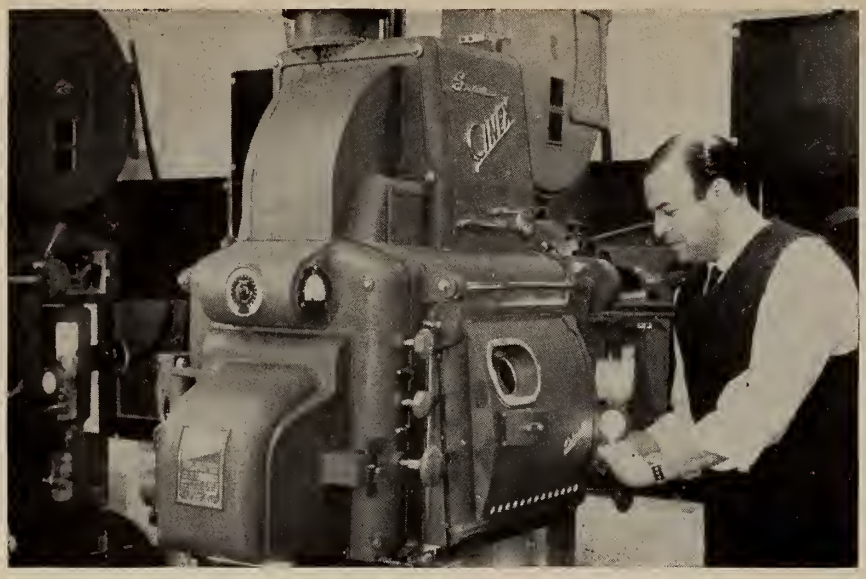
HOLLYWOOD, CALIF. — General Film Laboratories, film processing division of Pacific Industries, Inc., (San Francisco) turned out more footage of completed film for motion picture and television use in its Hollywood facilities in the first three months of 1961 than in any previous three-month period, it was announced here.

William E. Gephart, president of General Film, said the Pacific Industries division processed approximately 25 per cent more film than in the same period of 1960. He described the increase as being part of the generally brighter outlook in the entertainment industries, with both color and black and white film usage increasing. The long-term outlook continues to indicate that the processing of industrial and teaching films will be increasingly important to the General Film division as motion pictures for educational purposes find new users and markets.

iP

Audio-Visual Convention

CHICAGO — More than 3,500 delegates are expected to be on hand for the opening of the 21st annual convention of the National Audio-Visual association here Saturday (July 22) at the Morrison hotel. There will be more than 240 exhibits on the floor, an all-time record. The convention will close July 25. **iP**



A new look in theatre construction is the Town Theatre, Glen Cove, Long Island, New York. Because of its unusual characteristics it is being acclaimed by motion picture engineers to be the forerunner of a rejuvenated industry — it has been tabbed the Motion Picture Theatre Showcase.

The theatre seats 1000 and is equipped with every modern convenience including The Century Projector Corporation 70-35mm projectors and the outstanding Century Projector Multiple Channel Transistor Sound Systems.

It is said that the Town Theatre's presentation of 70mm projection and sound is second to none in the industry.

Below is a picture of the projection booth showing Andrew Marglin, projectionist, and president of I.A. Local 640 operating one of the Century 70mm projectors.

The Town Theatre is owned and operated by Sidney Sinetar and Sy Frank. The projection and sound equipment was furnished and installed by Capitol Motion Picture Supply Company of New York under the supervision of Peter Braut and Andrew Marglin.

Construction and Operation TOWN THEATRE, GLEN COVE, LONG ISLAND, NEW YORK

Architect: Leon Miller
Builder: Ira Miller
Operators: Town and Country Theatres
Electrical contractor: Atomic Electric
Projection and sound: Capitol Theatre Supply, Ben Perse
Projection mechanisms: Century JJ 35/70mm
Sound heads and preamplifiers: Century 6-4-1 transistorized
Power amplifiers: Altec 1568-A
Speakers: 5-R.C.A. P. L. 302 backstage 14 R.C.A. surrounds
Lamphouses and rectifiers: Ashcraft Super Cinex
Curtain and masking devices: Automatic Devices Co.
Rewind and storage equipment: Neumade
Lenses: Bausch & Lomb
Screen: Hurley matt white
Supervision of installation: Peter Braut, Capitol Theatre Supply, Andrew Marglin, Local 640 IATSE Ted Lebow, R.C.A. Service Co.
Projection staff: Andrew Marglin, Victor Solomon, Robert Hurd, Nassau and Suffolk Counties Local 640, IATSE

iP

GLEN COVE . . .

. . . Continued from Page 5

house manager of the Town Theatre.

The Sinetar and Frank firm also operates a theatre in Hewlett and in Wantagh, on the south shore of Long Island. Town and Country Theatres is an expanding circuit and according to reports the circuit has plans for new theatres in several Long Island towns.

iP

PRINTERS FOR PARAMOUNT

NEW YORK — Century Projector Corporation has announced delivery of three 35mm black and white film release printers to Paramount Pictures' Long Island laboratories at Long Island City, N. Y.

The printers, designed and manufactured under the supervision of Frank La Grande, have many innovations including multiple prints from a single negative, sound track and edge numbering, safety features, signal and control indicators, synchronous drives and automatic electric braking. It is anticipated that production costs of prints will be reduced and print quality improved. **iP**

RUFUS LEIGHTY DIES

KOKOMO, IND. — Rufus Leighty, former business agent of Moving Picture Projectionists local 544 IATSE, Kokomo, and an employee of the Alliance Theatre circuit, died here after a three-month illness at the age of 57.

iP

FILM EQUIPMENT EXPORTS UP

WASHINGTON — Exports of motion picture film and equipment and still photographic products from the United States rose substantially in the first quarter this year over January-March 1960, the scientific, motion picture and photographic products division, Business and Defense Services administration, U. S. Department of Commerce, reported today.

Motion picture shipments were valued at $13,053,729, a 13.6 per cent increase over the $11,488,251 of a year ago. Equipment exports, including cameras, studio and projection devices, were $4,595,425, approximately 14 per cent over the 1960 quarter.

iP

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New Screen Design Developments Allow Brighter, Cleaner Projection

Motion picture screens are better today than ever before in the history of the theatre. Not only has the reflecting surface been made brighter but with an increase in gain it has been possible to greatly improve side viewing conditions. Pearlescent pigments are responsible for increased efficiency. These pigments have been available in artificial form for many, many years and now there is available to manufacturers a natural pearl essence of unusually high purity. The lustre of this natural pearl surface not only increases initial brightness gained but the optical performance at wide viewing angles is of a high standard. The unique orientation of the pigments in the plastic mix accounts for this.

Also available on the market today is a surface that has anti-static qualities and which is claimed to repel the attraction of dust. The industry has recognized the dust problem for a long time. Even with the protection of a screen curtain, the picture image is nevertheless exposed all during operating hours to a large volume of air in motion. Dust-laden atmosphere accounts for an average light loss of 10 to 15 percent each year. This, together with normal oxidation, accounts for regular deterioration of the reflecting surface. Now, for the first time, the dust problem can be materially reduced and the efficiency of the reflecting surface maintained for a longer time.

Projectionists everywhere have read with great interest the report of the Motion Picture Research Council on the problems of screen brightness in outdoor theatres. The fact that their investigation showed some 57% of all drive-in theatres surveyed had center screen brightness levels under three foot lamberts comes as no surprise. Indoor standards are 9 to 14 foot lamberts of reflected light, leaving most drive-in screens far short of what is considered a satisfactory level.

There are, however, one or two compensating factors which must be taken into consideration. Firstly, visual acuity, which in simple terms is the ability of the human eye to perceive detail, increases as the size of the picture image increases. Therefore, the very large size of modern drive-ins is in itself a great help to the eye even though light is lacking. What is known as a satisfactory picture is the result — satisfactory in the sense that the public accepts the presentation without complaint. This should not deter anyone from trying to improve a situation that definitely needs improvement.

Secondly, the usual combination of arc light and a reflecting surface that creates light that is predominantly in the yellow-white part of the spectrum enables the human eye to respond well. Hardy and Perrin in their "Principles of Optics" show that the response curve of the eye is greatest in that portion of the spectrum between green and yellow. This means that the threshold of vision is greater in this area than it is say, for blue or red. It should be clear at this point that a properly designed reflecting surface is of the greatest importance. Fortunately, a pure white surface is perfect although its brightness gain leaves a lot to be desired. However, combining available reflecting surfaces with modern light sources permits the average drive-in to get by. This is really not enough. Effort is constantly being expended by many in the industry to improve the situation.

So far, reflecting surfaces of higher gain have made some progress but the problem requires a substantial expenditure of money. New surfaces have been planned but many cannot lick the problem of weathering, normal expansion and contraction and screen surfacings that are not uniformly applied and in perfect alignment, panel to panel, from side to side and from top to bottom. Applying higher gain panels on top of existing surfaces will, in most cases, make the new panels appear like a mosaic, simply because they cannot be perfectly aligned.

The most commonly used surface application is still white projection paint because of its comparative ease of application and its reasonable cost. It can also be removed without too much difficulty when complete retreatment is necessary. Until something practical comes along the drive-in exhibitor should look to the following: An adequate light source. An efficient optical system. Proper selection of aperture size. A clean and well maintained screen surface. Equipment to do a good job is readily available and supply dealers are prepared to improve conditions with the exhibitors desire to do so. **iP**



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New Motion Picture Technique May Bring Complex Developments for Projectionists

European movie goers are being treated to a new "avant-garde" motion picture technique in which live actors play their roles side-by-side with their own or other actors' filmed images. It's of interest to the IA and projectionists generally because it shows how far their craft might progress in the years to come.

Frantisek Pilat, Czechoslovak Film Corp., Praha, Czechoslovakia, has described "Magic Lantern" ("Laterna Magica"), a new art/entertainment form in which, for example, a living ballet dancer might dance with a film partner. According to Pilat, the actor's action is "inseparably combined with the motion picture," giving the impression that both are live performers.

First shown at the Brussels Worlds Fair where it was awarded the Grand Prix, "Magic Lantern" is now touring several European countries, the SMPTE meeting in Toronto was told.

Pilat also described "Polyecran," another new art form, which involves simultaneous exposure to the viewer of eight screens, each carrying a different image tied in with the central theme of the artistic presentation.

According to Pilat, "The new technology of wide-angle and panoramic motion-pictures renders it impossible for the artists to use a quick composition of shots, large close-ups or rapid panning movements of the camera, ie, to take advantage of the principal and specific means of motion picture art. Experience has shown, that the more the spectator is surrounded by the projection screen, the narrower is the choice of dramatic material, which can be reproduced with the aid of these new technical devices.

"In order to eliminate these disadvantages of wide-angle motion pictures, extensive experiments have been carried out by artists and technicians in Czechoslovakia in an effort to create a new type of film show by means of a simultaneous projection system employing projection screens, which, though variously arranged in space, are in direct connection with one another.

"The screens are of different size and differently inclined towards one another. On to those screens the picture from the film projectors or slide projectors is projected. The picture is accompanied by sound, which is reproduced over loudspeakers placed behind the various screens and also over loudspeakers suitably accommodated in the auditorium. The projected picture, which completely fills the spectator's field of view, creates inter-related impressions and their synthesis produces in the spectator's brain a unified image.

"To suit the action shown, one screen only is sometimes projected upon, the action spreading later gradually to further screens. At other occasions identical pictures are shown on several screens; sometimes the overall picture is on the main screen and the close-ups on the flanking screens; black-and-white film is combined with colored film, static projection with film projection, etc.

"Numerous shows produced for 'Polyecran,' have proved that it is an unusually adaptable means of expression for a new form of motion picture art. It has also been proved that the spectators, who number more than two million so far, have no difficulties in grasping the artist's aims and the structure of the action or story, even if it proceeds on a plurality of screens simultaneously."

iP



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BENJAMIN MARSHALL DIES

CHICAGO — Funeral services were held for Benjamin Marshall, a member of Local 110, Chicago Motion Picture Machine Operators' union, who died in June.

iP

Ampex Wins Academy Award

HOLLYWOOD, CALIF. — Ampex Professional Products Corp. has received a class two technical award from the Academy of Motion Picture Arts and Sciences for its design and production of a multi-purpose sound system "combining high standards of quality with convenience of control, dependable operation and simplified emergency provisions." The plaque, symbolic of the award, was accepted for Ampex by E. M. Lewis, who led research and development of the project.

The Ampex system is designed to reproduce optical and stereophonic magnetic sound tracks from either 35mm or 70mm film. The complex circuits necessary for this multi-purpose system are controlled by a single set of pushbutton selectors, making the system extremely simple and convenient to operate. Previous systems required as many as three sets of controls for optical and stereophonic sound. **iP**

RODNEY C. REA

KOKOMO, IND. — Rodney C. Rea, secretary and business agent of local 544, Motion Picture Projectionists, (Kokomo) died at St. Joseph's hospital here after a brief illness. He was 61 years old. In addition to his IATSE duties, Rea was employed by the Alliance circuit and served as a trustee on the Howard County (Ind.) Trades Council and was president of the Kokomo Labor Temple Assn.

iP



PROCESSOR — The Eastman Viscomat processor, about the size of a four-drawer file cabinet, processes 16mm motion picture film in approximately one minute — dry-to-dry time. In addition to its speed, the processor also produces work of top commercial quality.

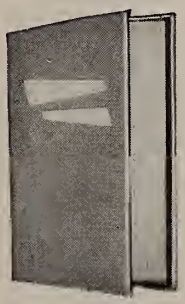
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ELECTRICAL NOISE

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By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

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MONTHLY CHAT . . .

. . . Continued from Page 3

Maybe this acquaintance may encourage the dealer's salesmen, who have given up the projectionist's boss as a sales prospect after so many discouraging pitches, to try again and finally succeed in selling replacements for run-down or worn-out projectors, arc lamps or other equipment.

Xenon Demonstration

The first American trade demonstration of the Xenon projection lamp system, the West German Ziess-Ikon development, took place July 12 at the Plaza Theatre, an art house in New York City, where exhibitors, projectionists, suppliers and other projection equipment manufacturers were present to see the black and white screening of "Never on Sunday" and a color Paramount short.

The dinner was sponsored by the City Investing Co., which owns the American rights to Xenon. John J. Callahan, Jr., vice-president of Cine Electronic Systems, Inc., a City Investing Co. subsidiary, reported that his firm will have a drive-in equipment system on the market later this fall.

The present system is primarily adaptable for art theatres. While 3,500 theatres have installed this system overseas, only two have installed it so far in the United States — the Plaza and the Victoria Theatres in New York City.

iP

Harwald Develops New Film Inspection Unit

EVANSTON, ILL.: An automatic, caster mounted, film inspection and cleaning machine, half the size of an office desk, is the latest development of the Harwald Company. Styled very much like an executive desk, it measures only 48 inches long by 22 inches deep. Its desk-height working space for splicer, records and accessories is 28 inches from the floor, and a handy seven inches below the unencumbered flat top on which the reels being worked on are within easy reach of the seated operator.

This "Inspect-O-Film Junior" (Model 61) was designed, according to the manufacturer, specifically to serve the film-care needs of the smaller film library, TV station, audiovisual education center or industry film department.

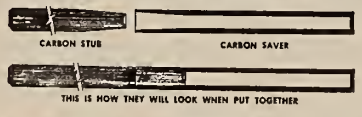
The "Junior Consolette" incorporates many of the features of the sturdy, time tested Harwald standard "Inspect-O-Film" in use in major laboratories and film centers throughout the world, and is warranted to perform effectively wherever a relatively lighter work load indicates the suitability of a lighter, smaller, lower-priced machine. The "Junior Consolette" carries the regular Harwald one year all-service guarantee, as well as life-time guarantee against any defect in material or workmanship.

Among the new model's features are an up to 2,000 foot reel capacity, up to 650 feet per minute inspection speed and up to 2,000 feet per minute rewind speed with automatic stop at end of rewind cycle. Its cleaning tapes are positioned ahead of the defect indicators. Splices are made without unthreading the film. The defect indicator may be released by means of a convenient foot pedal.

In tailoring the new model consolette to the varying needs of the smaller film center, the designers developed a further choice in optional components based on the volume of work involved and degree of accuracy demanded. A choice is offered between the standard laboratory type sprocket footage counter and a somewhat less exact friction-type electronic measuring device; there is choice also between the new Model "U" 3-jewel defect indicator and a less-exacting 2-jewel device, and between heavy-duty adjustable relays and a medium-duty discardable type.

Special attention has been given to convenience of operation by the film inspector. Seated as at an office desk, with all controls and working materials easily reached without getting up, the inspector can turn out more work with less effort. **iP**

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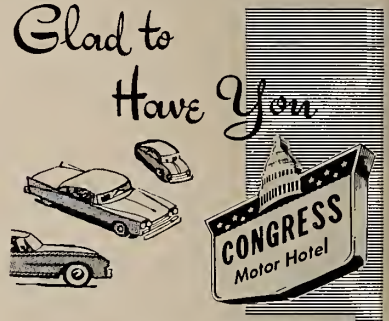
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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of oddress should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST ossumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

FILM CARE CO-OPERATION

With production costs soaring higher and higher, the independent producers are squawking about the cost of distribution. Compared to the salaries of salesmen, their transportation, meals and hotel accommodations, plus rent and administrative expense of the branches, the cost and handling of prints is proportionately small although it bulks large to producers in the overall total.

The problem of prints is, as always, a headache to the projectionist. The exchanges blame him or the theatre for damage. In some cases that may be true, but the majority of the booth craftsmen who run the prints through the projectors, rewind and handle them during run-of-the-show, have great respect for the machinery and materials they use. Worn out projectors and devices in the booth of the low-grade theatres account for most of the damaged prints which come back to the exchange, but this is a minor factor in the mutilation of prints.

The distributors, as is natural during high-cost operation, cut expenses on a penny-wise-dollar foolish basis, overloading the exchange film-handlers to the point that the back-room staff can't possibly job inspect and repair all the prints which come and go out of the branch.

Several years ago projectionists in England set up film-care committees which, in many instances, included representatives of the exchanges. Since production, distribution, exhibition and projectionists all have a stake in reducing cost and maintenance of prints, and the proper reproduction of the screen for movie-goers, it might be a good idea for the four groups to get together on a similar program in the U. S.

Frankly, we don't know who should take the initiative, but a movement of this kind would be a boon to the whole industry. It would end the eternal bickering between theatre and exchange, with the latter blaming the theatre and its projectionists and the former blaming the exchange for sending unspliced, scratchy or mulitated prints.

It would cut print expense to the industry which could be passed on to the exhibitor. Whether this would happen in film business may be doubted by many exhibitors, but the doubters should go ahead with the movement anyway, because, eventually, the producer-distributor would have to give a little, at least.

Most all first-run theatres have a rehearsal projection when they are running a new show. It would be good if all the theatres who pay through the nose for pictures, spend money for attraction trailers, newspaper advertising and local promotional tie-ups, would prepare the show with such an advance rehearsal. At least the first customers who paid their admission price would not have blank screens interrupting the entertainment because of a torn patch. People can see movies interrupted by mechanical trouble on their home TV set for free.

The way for the movie theatre to compete with the TV is by finer presentation on its bigger screen through improved techniques of lighting, camera work, script writing, direction and all the other crafts which go into current films.

This service to the public involves the producer, the distributor and the theatre, and it also involves the projectionist's pride in his craft, the work in which he earns his living.

We are sure the manufacturers and theatre equipment dealers would go along with any movement to improve

(Continued on Page 17)

INTERNATIONAL PROJECTIONIST

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IA Locals Collect Pennies from Heaven For Rogers Hospital

NEW YORK — A member of N. Y. local 306, IATSE, his shoulders and arms straining under the weight of two heavy bags, came into Ernest Lang's office at 362 W. 50 St., proudly showing his yield from theatres visited that morning in the "Scrap-N-Drippings" drive for the Will Rogers hospital at Saranac Lake.



Walsh

Ernie Lang, secretary of local 306, introduced the man — Aaron Gannon — to an **IP** reporter who was visiting in the office.

Gannon is one of the local's collection crew who travel to theatres, devoting their own time and carfare to aid the Will Rogers hospital cause.

Lang, who organized local 306's "Scrap-N-Drippings" effort, has it working efficiently through the membership. Projectionists spend their own time cutting the copper foil off carbon stubs as well as saving arc lamp drippings, which makes every penny for the salvaged copper go to the hospital. It's an effort that brings "pennies from Heaven." Lang said, "otherwise the copper would be wasted."

Since the collection drive, instituted by International president Dick Walsh of IATSE, the hospital has benefited by several thousands of dollars from IA locals coast to coast.

iP

ASA Accepts SMPTE Plan for Video Tape

NEW YORK — The American Standards Asociation's general conference on magnetic visual-aural recording has accepted the request by the Society of Motion Picture and Television Engineers for establishment of an ASA sectional committee on video tape recording.

SMPTE will serve as administrative sponsor. The committee is to be composed of manufacturers, consumers and representatives of other groups.

iP

Santa Cruz Projectionist Aids Anti-Pay TV Victory

SANTA CRUZ, CALIF. — James Wilson, business agent of Watsonville, Calif., projectionists' local 611, and operator at the Rio theatre here, played a major role in a successful anti-pay TV campaign conducted in the city.

George Atton, manager of the United California Theatres' Rio and chairman of the drive, said that "labor was an important factor" in the fight to block the attempt of TelePrompTer to move into coinbox television via the city's community antenna system.

"We wanted to drive home the fact that the average family would be hurt by pay TV.," Atton said. Wilson organized labor opposition and enlisted the support of George Harrison, secretary of the central labor union, who appeared at the city council meeting with Wilson and other labor leaders when the city officials voted 3 to 2 to refuse a 20-year extension of the antenna franchise.

Theatre Owners of America officials have called Atton's campaign which coordinated the efforts of all pay television opposition a model which should serve as a guide for future campaigns.

iP

IATSE Projectionists Back COMPO Campaign

OTTAWA — Declaring that the objectives of COMPO (Council of Motion Picture Organizations) "are high among our objectives also," Richard F. Walsh, president of IATSE, announced here that his organization has accepted an invitation to affiliate.

For years, our members in all parts of the country have been seeking to boost movie attendance by word of mouth, auto bumper stickers, floats in labor Day parades, sales of tickets to kiddies' matinees and sponsorship of union theatre parties," Walsh said. "Our locals have worked with exhibitor groups in opposing blue laws, censorship, admission taxes and the extension of daylight saving time.

"Through affiliation with COMPO, we feel that such activities can be coordinated and intensified. We are grateful to COMPO's executive committee for extending us an invitation to join."

iP

Labor Teams With Management on N.Y. Product

NEW YORK — Recognizing that "there is no separation of interest between management and labor" in film-making, Broadway producer Michael Myerberg and seven affiliates of IATSE have signed an historic agreement here making it possible for American to compete on a cost level with European motion picture production.

Myerberg said "all parties have been motivated to create a whole new atmosphere for production in which there is no separation between the interests of labor and management. After 18

(Continued on Page 17)

Set Theme of SMPTE Meet at Lake Placid, Oct. 2-6

NEW YORK — "Integration of Motion Picture and Electronic Systems" has been set as the theme of the 90th convention of the Society of Motion Picture and Television Engineers, convention vice president Harry Teitelbaum announced here.

The convention will be held Oct. 2-6 at the Lake Placid Club, N.Y. C. Loren Graham, a photographic engineer with the Color Technology Department of Eastman Kodak, will serve as program chairman. Topics and topic chairmen are:

Neal Keehn, General Film Laboratories, audio visual 8mm professional photography; William D. Hedden, Calvin Company, cinematography; William C. Griffin, U. S. Naval test station, high-speed photography and instrumentation; Adrian Terlouw, Eastman Kodak, integrated visual presentation systems.

Also George W. Colburn, George W. Colburn Laboratory, Inc., laboratory practice; John L. Forrest, Ansco, sound reproduction; Richard Callais, Astro Electronic Products division, RCA, space photography and image sensing; T. Gentry Veal, Eastman Kodak, subscription TV; Richard S. O'Brien, Columbia Broadcasting System, TV equipment and techniques; Norman Olding, Canadian Broadcasting Corporation, recording.

iP

Australian Circuit Technician Builds Optical Alignment Device

The author of the following article is director and technical supervisor of Village Drive-in Theatres Ltd. which operates seven outdoor theatres in Melbourne and Victoria, Australia. — Ed. Note.

By GRAY D. EDMESTON

One of the reasons for my interest in the **International Projectionist** article which described an optical alignment kit was that I designed and built a similar device three years ago — having prior to my effort searched through years of editions of technical journals to find something better than the rather crude designs then available here.

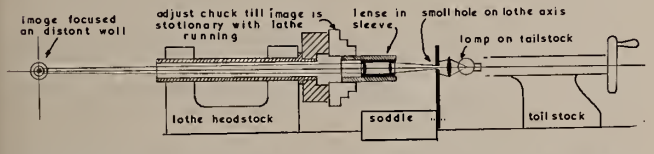
Whether I overlooked any existing optical tool for the purpose, I do not know, but the search being unsuccessful, I decided to try my hand at making one to my own design.

When completed this device proved to be a complete success and certainly justified all the time and work entailed. And I write the following description of the optical aligning tool on the assumption that it may be of interest to some of the **International Projectionist** readers.

The object of my design was to project a small circle of light (¼" dia. and in sharp focus) back into the lamphouse on the true axis of the lens jacket of the projector and to contain it's own light source to enable adjustment of mirror and positive carbon to be made by reference to the light image onto a target at both points.

This arrangement makes for a very quick and positive alignment as well as to extreme accuracy, particularly where the lamphouse has to be raised or lowered without screw adjustment, as is the case with the projectors in one of our theatres.

A large circular sheet of metal, with a target of circular



Set-up to machine lens and sleeve to true optical axis on the lathe.

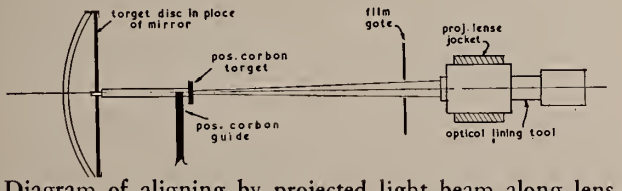
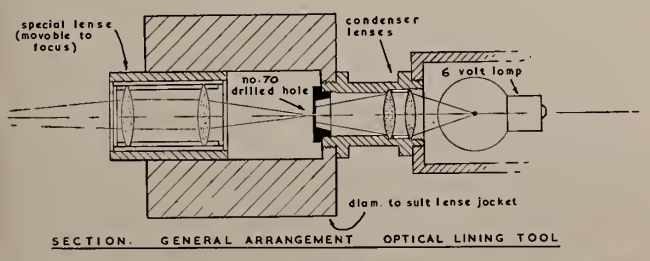
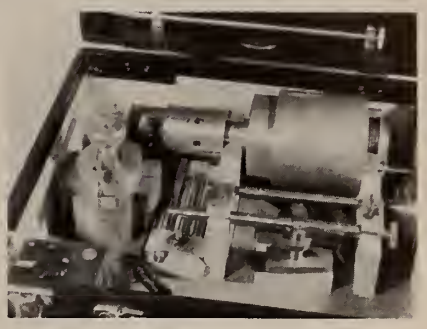


Diagram of aligning by projected light beam along lens axis.



Section showing general arrangement of optical aligning tool as designed by the author.



Edmeston's home-designed optical alignment device is compact enough to be packed into a suitcase.

rings at the center is placed in front or in place of the mirror and has a 1/16" hole accurately drilled center to locate and hold the sprigot of the positive carbon target the other end of the carbon target being supported in the positive guide, thus giving a circular ringed target on the positive carbon axis.

In the case of rotating positive high intensity lamps the light beam is required to pass through the centre of the carbon chuck at any point of it's travel and can be readily checked with a similar dummy carbon with sprigot and target.

The construction of an aligning tool such as this demands that the lens used to project the small circular image, has an optical axis exactly coinciding to its physical axis, and this was unexpectingly easy in my case.

The lens used was a very ancient Pathe of small diameter with the elements cemented against any future movement, the whole of which was fitted and locked in an aluminum sleeve long enough to allow for chucking in the lathe in a four jaw independent chuck.

Prior to chucking the lens, a piece of sheet metal was secured to the rear face of the lathe saddle and a small hole drilled in it from the chuck.

Behind this on the tailstock was mounted a small lamp arranged to shine through the hole in the sheet metal and down through the hollow mandrel of the lathe.

The lens was then held in the four jaw chuck and centralized to produce an image of the small hole on a wall some six feet away.

Rotating the lathe mandrel now produced a spot of light gyrating on the wall around the lathe axis. By patient adjustment of the chuck the condition was finally arrived at when with the lathe revolving the spot of light is stationary and at this stage the outer surface of the lens sleeve is turned to size, and the chucking portion parted off.

The lens as described is closely fitted in the housing so as to move for focusing the light spot, the source of which is a No. 70 drilled hole in a thin diaphragm behind which is a condenser system and a small 6-volt lamp.

It will probably be noticed that no reference has been made to the lining up of the picture aperture. This is done with a separate piece of equipment the forerunner of the lining tool and came about by my discovery that on a number of the projectors in our circuit, the lens axis was not true with the plane of the film gate, with horrible results

(Continued on Page 17)

Projection Personality:

Crank to Cinerama and Beyond . . .

By TOM KENNEDY

A projectionist developed arm muscle as well as pure mechanical ability when Jack Seraphine (whose senior rating in New York Local 306 is No. 7) started his still-active career back in 1903 — a 58-year span.

Those were the days when $100 could set up a movie show of about a half-hour of film clips with a nickel admission to a store show or for-free entertainment for the customers who bought beer and sandwiches in a saloon.

Jack, now a hale and hearty 72, traveled down memory lane with this IP correspondent and his story traced the technical progress of the industry from its humble beginning to today's superior techniques of production, theatre design, and the electronic age of projection and sound.

Since Seraphine's boyhood as a helper for his step-father — Nicola Seraphine, a pioneer movie showman — Jack grew up in the business and has stuck to it ever since.

As a boy, Jack saw Nicholas Powers, who designed and manufactured the Powers projector, come to install one of his machines in his step-father's the Curve Hotel in Fort George, a turn-of-the century resort section at 195th St. and Amsterdam Ave., New York.



Fifty-eight years of projection work sit lightly on the shoulders of 72-year-old Jack Seraphine of New York local 306.



The year was 1917, the place Chattanooga, Tenn., when Jack Seraphine posed with Annette Kellerman, starred in "Daughter of the Gods," during a road show tour of the William Fox spectacular film.

Still active as a projectionist at the RKO 86th St. Theatre, Jack has come a long way from a raised platform (no enclosed booth) with its hand-cranked projector to the three booth projectors of the first Cinerama of which he was one of the projectionists.

Seraphine is quick to admit that the projectionist who got into the craft years ago had a distinct advantage over the newer projectionist. The improvements and technological developments came slowly and the projectionist could take them in stride whereas new craftsmen must have an engineering background to cope with the electronic age of projection and sound.

During his career he worked for such former industry greats as D. W. Griffith, he toured with the road show of "Hearts of the World;" did the same for Bill Fox's spectacular film production, "The Daughter of the Gods;" and worked for the famed Roxy, who was a bug about good projection and screen effects in the New York Rialto, Strand and later at the Roxy.

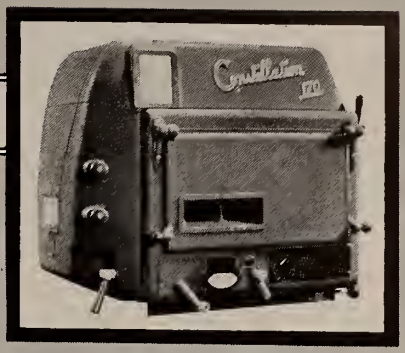
Seraphine talked about the early projectionists' effort to organize. Their first attempt, he said, was a proposition from a man who said he would set up an organization if the projectionists would each put up $5 to get the thing started. Several of them, Seraphine said, chipped in the $5, and the man skipped with the loot and nobody ever heard of him again. Later, an auxiliary was formed for the vaudeville and legitimate theatres and the projectionists were taken in as "spotlight men."

Jack, a native New Yorker, has worked in New York theatres mainly, but has gotten around the country from time to time and, as most projectionists see it, believes the theatre customers pay their money to see a screen show with high standard projection and sound. He just doesn't understand why some theatre owners won't hesitate to pay out dollars for dressing up the lobby and are reluctant to part with pennies to keep their projection up to standard.

CONSTELLATION

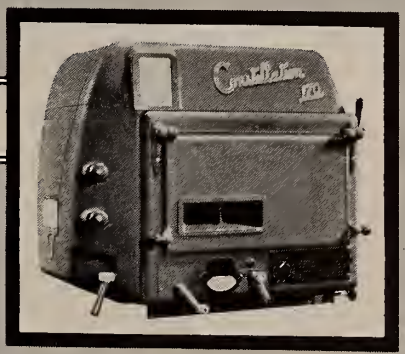
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Single booth Cinerama at the Grand, Columbus, Ohio, with David Cornwell and Harry Coleman of local 386.
(Photos Courtesy IATSE Bulletin)

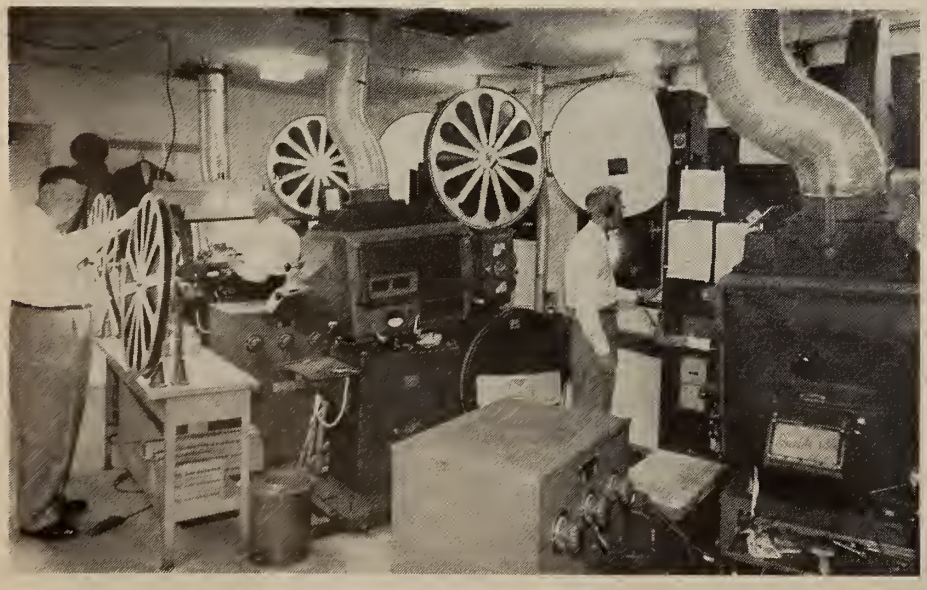
CINERAMA:

Widescreen Projection Revolutionized Motion Picture Industry Nine Years Ago

Cinerama, which nine years ago caused a revolution in the film industry (many film men regard it as a saviour of the industry because it ushered in the era of the Big Screen) is no longer a novelty seen only in large population centers here and in foreign lands. When Cinerama first opened in New York Sept. 30, 1952, projectionists had to be specially-trained to operate the three-projector system. Now hundreds of the craft are daily screening Cinerama shows coast to coast in this country, in Europe, Latin America, Asia and Africa.

Available product explains expanding Cinerama exhibition either in houses converted to the medium or in new theatres especially constructed for "wall-to-wall and floor-to-ceiling" screen presentations. New Cinerama theatres have a backlog of five films and two more are in production by MGM, which has agreed to produce a total of four.

Other factors in the spread of the Cinerama process is that the company, Cinerama Inc., is licensing circuit-operated units and independent theatres, with the equipment owned and installed by Cinerama which also trains local projectionists, and sets up a promotion and advertising campaign for the theatre.



Inside the booth of the Grand theatre, Columbus, showing the three Cinerama projectors located in one booth. Projectionists Harry Coleman is at the rewind, and Orland C. Mackey is trimming a lamp. Both are members of local 386.

Of the 20 Cinerama theatres now operating in the United States and Canada, only six are four-wall deals by the Cinerama company. These include Boston, Boston; Music Hall, Detroit; Warner Hollywood, Hollywood, Calif.; Clairidge, Montclair, N. J.; Imperial, Montreal; Orpheum, San Francisco.

Other theatres now showing Cinerama in this country include the Hellman, Albany, N.Y.; Grand, Columbus, Ohio; Cooper, Denver; Indiana, Indianapolis; Rialto, Louisville; Palace, Milwaukee; Century, Minneapolis; Cooper, Oklahoma City; Cooper, Omaha; Syosset, Syosset, N.Y.; Paramount, Toledo; Villa, Salt Lake City; Loew's Palace, Memphis; Cinerama, Providence, R. I. Converting to Cinerama are several established houses, including Lockwood and Gordon's Colonial in Hartford, Conn.

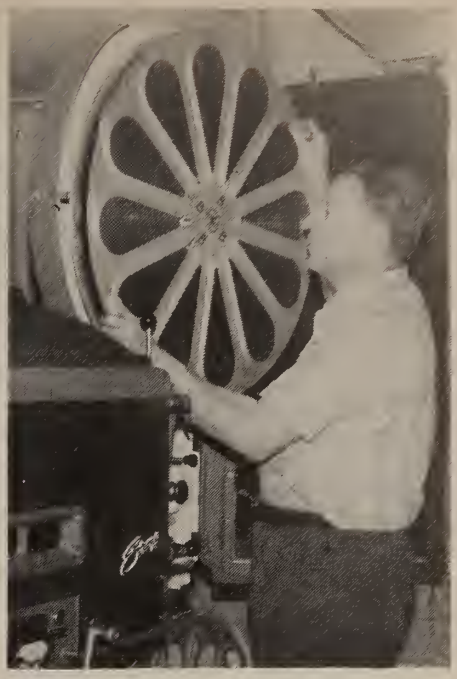
Presently a total of 39 theatres are showing Cinerama world-wide. The 19 theatres overseas include theatres in Buenos Aires; Sydney and Melbourne, Australia; Sao Paulo, Brazil; Chile, Santiago; Havana; London; Munich and West Berlin; Milan, Italy; Osaka and Tokyo, Japan; Rotterdam, Netherlands; Auckland, New Zealand; Lima, Peru; Kuala Lumpur, Singapore; Johannesburg, South Africa; Barcelona and Madrid, Spain; Goteborg, Sweden.

The company's technical department has blueprints for three screen dimensions. The newest theatres built for Cinerama, the Cooper in Denver, and the Cinerama Theatre in Johannesburg have screens 98 feet on the curve. Both are wall-to-wall (about 69 feet) and floor-to-ceiling (about 38 feet) screens.

The company in addition to licensing the theatres also distributes the Cinerama pictures and will do so for the four pictures being produced by MGM. The currently available shows are "This Is Cinerama," "Cinerama Holiday," "Seven Wonders of the World," "Search for Paradise," and "Cinerama South Seas Adventure."



H. R. Fuhrmeyer, Local 228 IATSE, in a single booth Cinerama installation at the Paramount Theatre, Toledo. Included in the equipment are Strong projection arc lamps.

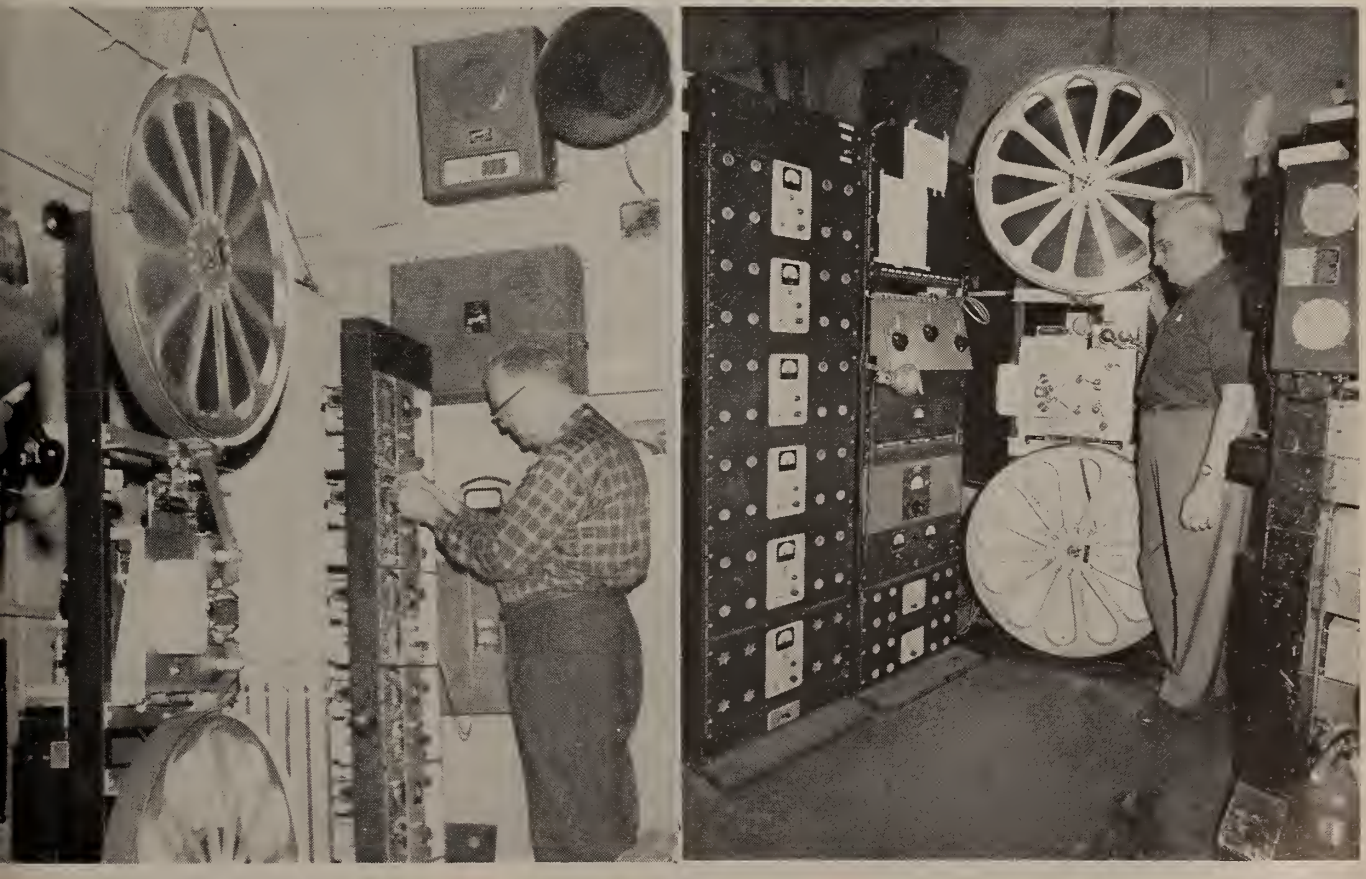


Clairidge theatre, Montclair, N. J., constructed a booth to accommodate the three Cinerama projectors and the console, or control panel.

MGM is now producing "How the West Was Won" and "The Wonderful World of the Brothers Grimm," the latter being produced by George Pal.

For the initial Cinerama show in New York the three projectors were on the main auditorium floor with the sound console forward toward the screen. Now the three projectors and console are located in the upper projection booth, both for the new converted and theatres specially built for showing Cinerama.

iP



One-booth Cinerama installation at the Clairidge theatre, (left) Montclair, N. J., Erich Patky, member of Newark Operators local 244 checks the amplifier. Sound booth of the Indiana theatre, (right) Indianapolis, Ora Cunningham of Local 194, checks equipment.

Everywhere in the world ... because it's on film

QUES. What do they do when it's carnival time in Trinidad?

ANS. They have the time of their lives. They walk and talk; they prance and dance; they munch and lunch; they go to the movies—see the same shows you see—laugh and cry just as you did.

For people are people everywhere—act like people, wherever they are.

That's why the picture *made on film* goes on and on until a world of people has been moved, stirred, cheered by it!

Yes, films tell and sell, are—when you come right down to it—just about our best good-will ambassadors. That's why the investment of time, talent and fine materials is so important; why the Eastman Technical Service for Motion Picture Film is constantly on the alert to help the industry in solving questions of production, processing and projection.

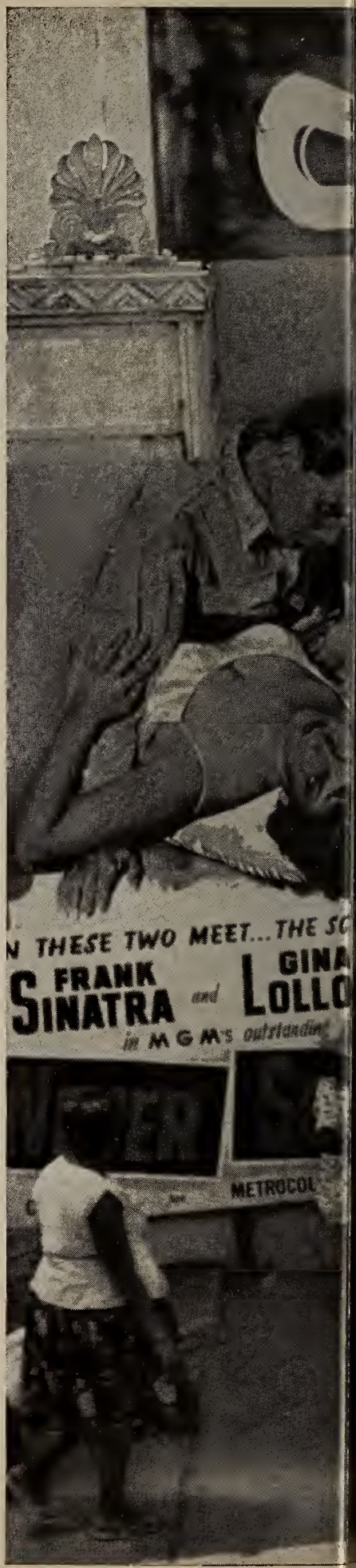
Branches at strategic centers. Inquiries invited.

Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N. Y.

East Coast Division	*Midwest Division*	*West Coast Division*
342 Madison Avenue	130 East Randolph Drive	6706 Santa Monica Blvd.
New York 17, N. Y.	Chicago 1, Ill.	Hollywood 38, Calif.

For the purchase of film, **W. J. GERMAN, INC.**
Agents for the sale and distribution of Eastman Professional Motion Picture Films,
Fort Lee, N. J., Chicago, Ill., Hollywood, Calif.






GLOBE
AND
MASCOPE

Everywhere in the world ...because it's on film

QUES. What do they do when it's carnival time in Trinidad?

ANS. They have the time of their lives. They walk and talk; they prance and dance; they munch and lunch; they go to the movies—see the same shows you see—laugh and cry just as you did.

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Zeiss Ikon Xenon Projection Lamps Demonstrated by U.S. Distributor

Cine Electronic Systems Inc. recently demonstrated the Zeiss Ikon Xenosol lamps for theatre projection at the Plaza theatre, New York, the latest of two theatres in the city to install the Xenosol lamps. The Victoria on Broadway has been screening its pictures with these lamps for some time.

John J. Callahan Jr. vice president in charge of sales for the Cine Electronic Systems which is marketing the Zenosol lamp in the United States, and Prof. A. Jekste, technical director of the company, were in charge of the demonstration with black-and-white and color films shown on the Plaza screen. The pictures were projected by the Plaza's Xenosol 2000-watt lamps.

Callahan said the Zeiss Ikon short arc Xenon tubes are available in 500, 1000 and 2000 watts.

The Zeiss Ikon Zenosol lamphouse consists of the principal mirror at the back; the Xenon bulb, before it the auxiliary mirror, and up front the ignition device, which supplies the high voltage to ignite the arc in the xenon gas discharge bulb which is enclosed within quartz glass. The lamphouse is provided with a honeycomb condenser.

Controls are situated on the back of the lamphouse. The door on the operational side has a switch which closes the A. C. circuit to the ignition device only when the door is properly locked. The door may not be opened for five minutes after the current to the bulb was turned off. To avoid danger of an explosion, the bulb must have at least five minutes of cooling period.

The Xenon gas discharge lamp as a light source for theatre projection was discussed in an article in the February, 1961, issue of International Projectionist. See page 4 of that issue for the article. — Ed. Note.

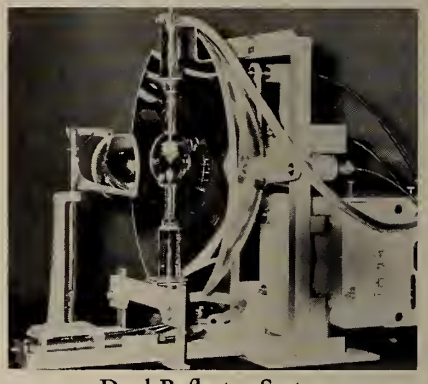
The lamphouse is suitable for using all three types of Xenon bulbs — with the bulb-holder adjusted for the different lengths of the 1000 and 2000 watt bulbs; extension pieces are supplied with the 500 watt bulb.

The 1000 and 2000 watt bulbs have an average useful life of 1500 hours. The bulbs sell for $350 each.

The lamphouse can be used for right or left-hand operation, since all control gear is located at the back. An interference protector is built into the ignition device to prevent affecting the loudspeaker installation. An ammeter on the back of the lamphouse indicates the lamp-current. Also, on the back of the lamphouse is a counter for the operational hours which switches on automatically when current flows through the bulb. Thus the Xenon bulb can be fully utilized for the indicated operational hours.



Xenosol Projection Lamp



Dual Reflector System



View of Lamphouse with Xenon Tube in Position

Prof. Jekste summarized the advantages of Xenon light for motion picture projection as follows:

"The Xenon lamp does not need any service or attention during the operation, so the projectionist can devote his attention to other aspects of his work — focusing, quality of sound, change-overs, etc.

"The lamp need be switched on only just before the change-over.

"Both mirrors can be adjusted independently of each other and of the stationary Xenon-bulb, with provision to prevent them from unintentional displacement.

"The light color is not dependent on voltage variations in the power supply and the spectral characteristic of Xenon light is close to the sensitivity of the eye.

"No smoke, gasses and other com-

(Continued on Page 18)



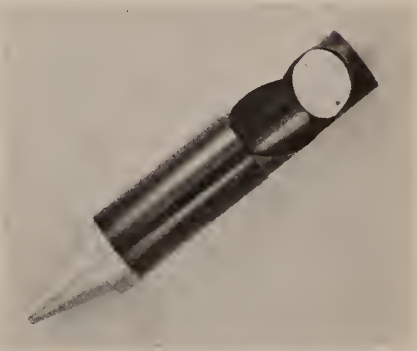
YOUR NATIONAL CARBON ENGINEER...

Sells you the best product—gives you the best service!

The illustration shows a NATIONAL CARBON Sales Engineer using the Motion Picture Research Council's Projector alignment tool to position the mirror on the optical axis of the projection lens.

These Sales Engineers—equipped with complete service kits containing the most modern test equipment—are trained to solve screen lighting problems and help the industry achieve the ultimate in picture quality. This is an important part of NATIONAL CARBON's continuing program of service to the industry.

For best projection results, use "National" projector carbons—for dependable, free technical service, call on NATIONAL CARBON. For details, ask your NATIONAL CARBON supply dealer or write: National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada:* Union Carbide Canada Limited, Toronto.



With the Motion Picture Research Council's projector alignment tool it is possible to determine within a few minutes—while the show is on—if the optical train is in alignment, or what adjustments need be made.

"National" and "Union Carbide" are registered trade-marks for products of

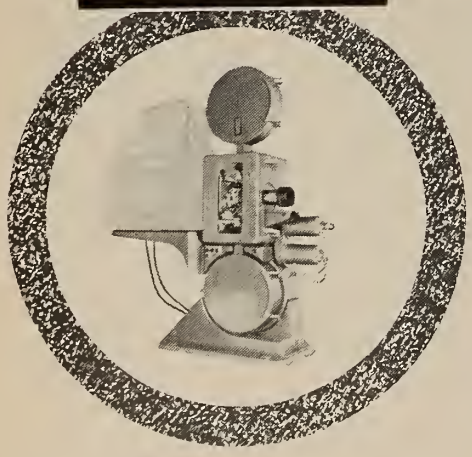
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70mm PROJECTION



- **BRIGHTNESS** The Norelco 70 allows 3 or 4 times as much light to pass through as a 35mm projector.
- **SHARPNESS** The 70mm film image is far sharper because it is blown up only a fraction as much as the 35mm image.
- **ECONOMY** Projectionists report runs as high as 2,000 per print with the Norelco Universal 70/35.
- **FLEXIBILITY** Complete conversion from 70mm to 35mm takes less than 4 minutes with the Norelco.
- **RELIABILITY** The Norelco 70/35 is the most widely used, thoroughly proven 70mm projector in the world.
- **PROFIT** The dramatic superiority of 70mm projection pays off! The best of the great boxoffice attractions are being released on 70mm prints.

See your favorite theatre supply dealer today. *Write for free descriptive brochure*

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Instant Sync Cuts Dubbing Time, Cost

NEW YORK — A new invention, Instant Sync, is designed to cut the time and cost of post syncronization, or dubbing from one language to another in motion picture or TV.

Lemback Inc. (headed by Jean Lenauer, president, and Myer P. Beck, vice president) which will market the machine, recently demonstrated the process for the trade press in New York. The demonstration was of voice-dubbing from a recording studio to the Instant Sync machine located five miles away in the West Bronx via telephone cables.

The demonstration consisted of post syncronizing a five-minute segment of film in about ten minutes. It was said that a five-minute segment of film post synchronized by present industry practice would require a full day.

Dennis Gunst, originator of Instant Sync, handled the machine in a West Bronx plant, showing that one machine can service several sound studios in a local area.

Instant Sync eliminates the present method of loops (segments of film that are projected repeatedly until the actor succeeds in replacing the original sound track).

The invention uses an electronic audio principle wherein the original sound track is prepared with electronic start marks wherever the natural pause occurs in speech patterns.

iP

Back Issues, Anyone?

The editors of INTERNATIONAL PROJECTIONIST have received a number of inquiries recently for back issues of the magazine. We have been unable to fill many of these and it has occurred to us that many of our loyal subscribers may have accumulations which they no longer need. If so, we will be glad to act as a "clearing house" bringing together those who want and those who have back numbers. The requests are usually for "runs," or consecutive issues covering periods of a year or more. DO NOT SEND us the magazines, but supply us with lists of what you have available. We will transmit this information to those wanting back numbers. Price and terms are a matter for negotiation between buyer and seller. The editors of International Projectionist asume no responsibility for such transactions, we merely offer our services to bring together the "haves" and the "have nots." There is, of course, NO charge by IP for this service.

Remember "Soundies?" Movie Juke is Back

SAN FRANCISCO — Announcement by a local manufacturer's rep that it is exclusive U.S. dealer for an Italian designed coin film and sound machine described as a "push-button movie juke box," recalls an early post-war experiment along the same lines. Dubbed "Soundies," the machines made a brief appearance in taverns and cafes but the cascade of coins ended abruptly when television boomed.

iP

You're Paying for a CRON-O-MATIC Carbon Saver

. . . why not get it now and start saving $400 annually! Stops carbon waste. Burns any length positive stubs in Ashcraft "D" or "E", Brenkert-Enarch, Peerless Magnarc, or Strong Mogul. New carbon automatically goes into use without affecting lamp operation.



At your dealer or order direct.
ONLY $42.50

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( ) Send Literature.
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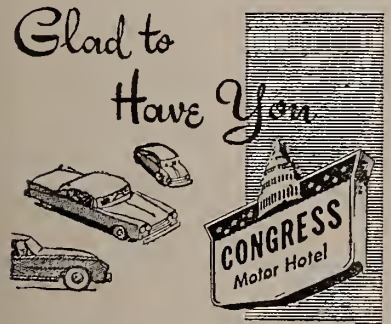
Export: Frazer & Hansen, Ltd.
San Francisco, New York,
Los Angeles

IATSE Executives Back JFK's Stand on Strikes

OTTAWA — Agreeing that the nation's defense and missile programs must be acelerated, the general executive board of IATSE has pledged its support to the plea of President John F. Kennedy to help prevent strikes and work stoppages impeding the progress of work at the nation's launching areas.

The board took its action at the semi-annual session held in Ottawa at Chateau Laurier. IATSE represents cameramen, editors, lab technicians and specialists in related crafts employed at Cape Canaveral, Fla., and other missile sites.

A declaration of policy containing strong safeguards against walkouts was adopted. Pointing out that the present world crisis "threatens the destruction of democratic forms of government and the subjugation of free peoples", the IA declaration said: "It is the solemn duty of every loyal and devoted citizen - management and labor alike — to make such sacrifices as are necessary to eliminate any and all causes which would interfere with or retard the acceleration of the missile program." **iP**



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From coost to coost, motels disploying the Congress sign proudly offer fine occommodotions to traveling Americo.

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BalCOLD® REFLECTORS DOUBLE FILM LIFE

...because BalCOLD Reflectors cut heat in half!

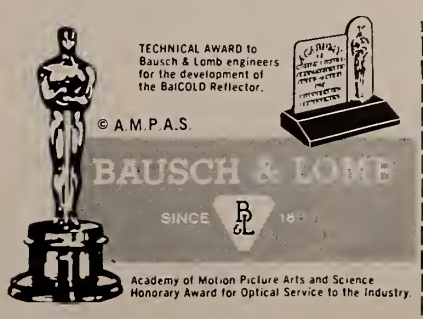
Heat is tough on film prints—especially when they can cost upwards of $7000.

But BalCOLD Reflectors save damage costs by keeping film cool. They have actually doubled film life. Says one theatre man:

"Used to get about 150 runs of a film with ordinary reflectors. Using BalCOLDs, I got 303 runs with 'Porgy and Bess,' 365 runs with 'Can Can.' "

What's more, reduced film heat means no more focus drift, greater depth of field. BalCOLD Reflectors far outlast ordinary reflectors and are lots easier on projectors and lenses.

Next time you replace silvered reflectors, replace them with BalCOLD—the only reflector whose proven contribution to the advancement of motion picture projection has won for its designers the highly regarded technical award from the Academy of Motion Picture Arts and Sciences.



BAUSCH & LOMB INCORPORATED
61620 Bausch St., Rochester 2, N. Y.

Send me BalCOLD Data Brochure E-35.

Name .....

Theatre .....

Address .....

City ..... *Zone* ..... *State* .....

Kalart Expands in A-V Field; Merge TSI with Victor Sept. 1

PLAINVILLE, CONN. — Technical Service Inc., manufacturer of special-purpose 16 mm projectors, will be merged with Kalart's audio-visual division, Victor Animatograph Corp.

Kalart Co. Inc., announced in July that it had purchased TSI, and that the company's facilities and offices, formerly headquartered in Farmington, Mich., would be moved to Kalart's headquarters in Plainville.

According to Kalart's announcement of the TSI purchase, the move was made to expand the company's audio-visual division. TSI products will be made under the Victor name.

The TSI purchase is the fourth acquisition by Kalart in 11 years. Kalart started manufacturing photographic accessories in 1930 and introduced the first photo-flash synchronizer. The company expanded into the manufacture of equipment for the motion picture and audio-visual field in 1950 by acquiring the Craig Manufacturing Co., makers of film editors and splicers. Kalart acquired Victor Animatograph Corp. in 1957, and later bought the Sound-view line of 35mm filmstrip and sound slidefilm equipment.

With the acquisition of TSI, Victor will offer a line of 16mm projectors with such special-purpose features as built-in TV-type screens and provision for repeat or continuous projection. The Kalart plant will produce TSI's "Doulite" and "Moviematic" models. The former are equipped for both rear projection on a built-in screen as well as for standard screen projection. A feature of the built-in screen is its portability, the projector may be operated virtually anywhere. **iP**

RADIANT APPOINTS MOZZONE

MORTON GROVE, ILL. — Appointment of John Mozzone as southeastern district manager for Radiant Manufacturing Corp., here has been announced by Jack Bartlett, sales manager. **iP**



CONVERSION FACTORS — A reference table for engineers and other executives in wall chart form has been published by Precision Equipment Co. This conversion chart (shown above) is useful for engineers, shop men and other executives. Included are common conversions such as inches to centimeters or watts to H. P. as well as many conversions that are difficult to locate in reference manuals. Some such examples are atmospheres to Kgs/sq. cm, cm/sec to miles/hr, cu. ft. to liters, microns to meters, and quintal to lbs. For your free wall chart of conversion factors, write Precision Equipment Co., 4411E Ravenswood Ave., Chicago 40, Ill.

iP

"Jet and Rocket Engines" New Science Film Short

BLOOMINGTON, IND. — Indiana University's audio-visual center has produced a new science film — "Jet and Rocket Engines."

The 10-minute film was prepared primarily for high school science and physics classes, may also interest special groups such as science clubs and aviation hobby clubs.

iP

Foreign Nations Send Students to NYU Class

NEW YORK — Thirty persons from seven countries, Iraq, England, Israel, France, and Canada attended New York University's fourth annual summer motion picture workshop, a six-week program emphasizing creative film making. Conducted by the department of television, motion pictures, and radio of NYU's communication arts group, students work in groups of five or six, with each group producing a film in the University's studios at Washington Square.

The staff for the workshop included Lee R. Booker, president of Vision Associates, Inc.; Herman J. Engel, writer-director of documentary and educational films; Haig P. Manoogian, associate professor in the NYU department; William S. Resnick, producer, director, and writer of documentary, educational, mental health, and political orientation films; and Leo Seltzer, producer and director of documentary, educational, and industrial films. **iP**

MGM Gets 1,600 Orders For "Kings" Film Strips

CHICAGO — Metro-Goldwyn-Mayer has received the first wave of orders for the religious and promotional film strips on "King of Kings" following a preview of the material for the National Audio-Visual Association.

NAVA members saw the film strips at special showings at the Morrison Hotel, resulting in over 1,600 immediate orders. Society of Visual Education, which produced the film strip, will handle the nationwide distribution to thousands of schools and religious organizations. **iP**

Kodak Sets $70 Million Budget for New Facilities

SAN FRANCISCO — Eastman Kodak has budgeted $70 million for facilities for new and improved products and services during 1961, William S. Vaughn, president, told the San Francisco Society of Secruity Analysts. **iP**

• BRIGHTER LIGHT
• LONGER BURNING
• SHARPER PICTURE
Free Test Samples

Lorraine ORLUX Carbons
CARBONS INC., BOONTON, N. J.

• STEADIER LIGHT
• LESS ATTENTION
• PERFECT COLOR BALANCE
Free Carbon Chart

MONTHLY CHAT . .

. . . Continued from Page 3

motion picture presentations, since the manufacturers of all elements of projection and sound equipment for theatres have, on the record, spent time and money for finer movie presentations in their factories, memberships and leadership in organizations benefitting the film industry.

Projectionists could play key role in any movement for conservation of prints to the end that the industry would save money and, more importantly, the theatre patrons would be better served in the movie houses by faultless reproduction of these costly productions. **iP**

AUSTRALIAN . . .

. . . Continued from Page 5

on Cinemascope, as regards focus.

This extra piece of apparatus is fairly simple and is capable of detecting lens-gate out of axis to approximately .001″ in 4″ and the use of this device made the world of difference to Cinemascope presentation through proper alignment.

We operate seven drive-in theatres here in Victoria, the two largest of 900 cars and the two smallest of 500 cars, Sound equipment by R.C.A. Lamps, one Mole Richardson H.I. with modified contacts, four B.T.H. automatic lamps and two Australian SupaMax, drawing respectively 130, 110 and 110 amps. One item sadly missing in Australia is a 5 to 1 movement projector. **iP**

LABOR TEAM . . .

. . . Continued from Page 4

months of negotiation, an agreement has been completed which we believe will implement this ideal. Three items in the agreement might be cited to indicate the general broad scope and good will expressed; (1) interchangeability will be permitted. (2) size of the crew shall be adjusted in the interest of economy and efficiency with sacrifice, however, of quality. (3) participation in production profits."

The unions involved are: Assistant Directors and Script Clerks, local 161; Stage Employes, local 340; Motion Picture Operators, local 640; International Photographers of the Motion Picture Industries, local 644; Theatrical Wardrobe Attendants, local 764; Motion Picture Film Editors, local 771; and Make-up Artists and Hair-stylists, local 798.

Myerberg will make five motion pictures within the next two years. He started as producer of vaudeville units in 1926, branching out in the 30's to legitimate theatre, musical comedy, concert, opera, dance, and motion pictures including "Patterns" and "Hansel and Gretel." **iP**

Breaking Mirrors? *It can't happen with*
HEYER-SHULTZ
UNBREAKABLE METAL REFLECTORS

TOP SCREEN ILLUMINATION	5 YEAR GUARANTEE
WILL NOT PIT OR TARNISH	FACTORY REFINISHING SERVICE

See Your Theatre Supply Dealer *Manufactured by* **HEYER-SHULTZ, Inc.** *Cedar Grove, N. J.*



SHARP
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IN PROJECTION

Kollmorgen lenses rate tops in the motion picture industry. Used exclusively with Cinerama, they are standard equipment in more than 70% of American theaters. Wire sharp contrast of the projected image on the screen—the whole screen—is typical of the outstanding performance of SUPER SNAPLITE® lenses.

Other advantages that add up to superior screening with SUPER SNAPLITES are:

- Fastest lens speeds
- Uniform illumination
- Crystal clarity
- Wide range of focal lengths
- Sealed construction

Bulletin 222 describes Kollmorgen lenses in detail. See your equipment dealer, or write us direct.

K C **KOLLMORGEN**
CORPORATION
NORTHAMPTON, MASSACHUSETTS

Brochure Published on Westrex Densitometers

Westrex Recording Equipment division of Litton Systems Inc., has published a new brochure on Westrex densitometers, for density measurements of color and black-and-white positive or negative motion picture film and optical sound tracks.

The unit gives direct reading of the print or sound track density as the motion picture film is held in place. Copies of the brochure (Bulletin 3.9) are available from Westrex, 335 N. Maple Dr., Beverly Hills, Calif.

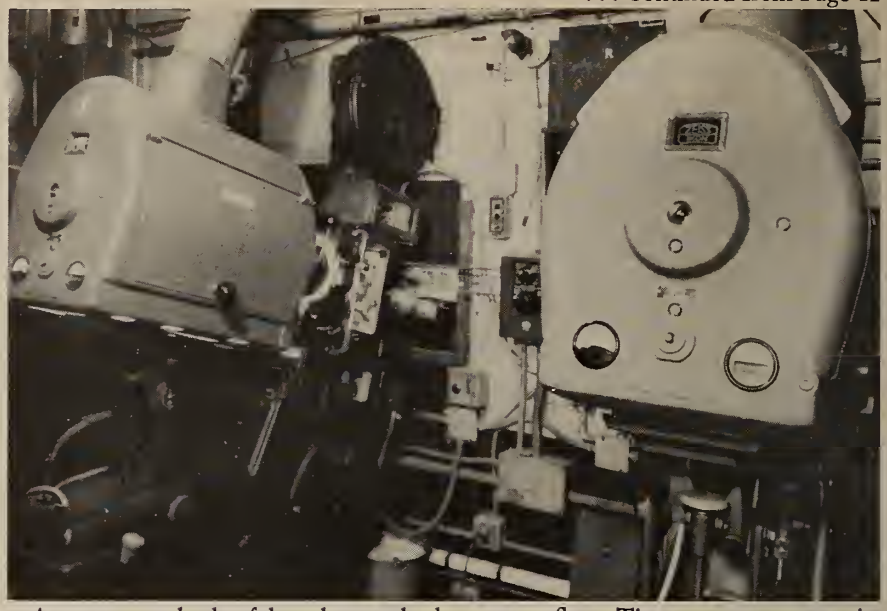
iP

DIAMOND
TRADEMARK
PROJECTOR CARBONS
Better Light! Lower Costs!
RINGSDORFF CARBON CORP. East McKeesport, Pa.



ZEISS IKON XENON . . .

. . . Continued from Page 12



Ammeter on back of lamphouse checks current flow. Time counter automatically registers hourly operation total, guaranteeing full usage of Zeiss Xenon lamp.

bustion is developed in the booth.

"The color temperature of all Xenon lamps is approximately 5500 K, which is very close to daylight. The efficiency of the lamp is 25 to 35 lumen per watt.

"The short arc Xenon lamps have a globular shaped quartz bulb, and the arc is burning freely in the widest part of the bulb, the so-called current stabilized arc. The distance between the electrodes is only a few mm, and because of the small distance, the operating voltage is low — between 20 and 30V. The spectral lines of Xenon gas are situated outside the infrared part."

The present available Xenon bulbs, up to 2000W, decided Cine Electronic Systems to center sales efforts on theatres of seating capacity from 600 to 1000. The 2000W Xenon bulb can be used in theatres with screens up to 35 feet wide.

A Xenon lamp of 2500W has been in development and is scheduled to reach the market soon. "It will provide a light source for the widest theatre screens," Prof. Jekste said.

Zeiss Ikon are pioneers in developing Xenon lamps for theatre projection. The development of the Xenon bulb from first experiments to a technically acceptable light source has taken about 10 years. In 1954 Zeiss Ikon demonstrated a projector with a 1000W Xenon lamp at the Cinematrographic Assoc. in Germany. In Europe there are said to be 3500 theatres projecting motion pictures with Xenon lamps.

Cine Electronic Systems Inc., which was formed by City Investing Co., is showing the Zeiss Ikon Xenosol lamps to theatre owners, television and other interests. Callahan said the company has not decided on a distribution policy for outlets around the country for the Zenosol lamps.

iP

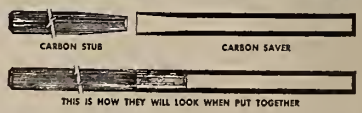
Canadian Lab Workers Ask Part of Print Biz

OTTAWA — Canadian members of IATSE have endorsed a move for an import duty on 35mm motion picture color prints processed in the United States for exhibition in commonwealth theatres, it was disclosed here.

Although the union's demand coincides with the Canadian government's current campaign to strengthen home industry and reduce reliance on U.S. imports, it does not necessarily reflect official policy, it was reported.

iP

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'LITTLE MISER' CARBON SAVER



Precisian Mode on Automatic Screw Mochine

- New block oxidized finish
- No tools needed to use
- Does not domage lamp mechonism
- For use with Rototing lamps only
- Save hundreds of dollars on carbon bills
- No chonge in price

9mm, 10mm, 11mm size ..... $3.00 each
13.6mm size ..... $4.50 each

Order direct if your supply house does not stock

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» AUTHORITATIVE
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Acclaimed by leading technicians in the industry as the most comprehensive and down-to-earth handbook published to date on the subject of motion picture projection. Ideally suited for study and reference by your operators.

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MANUAL OF PRACTICAL PROJECTION

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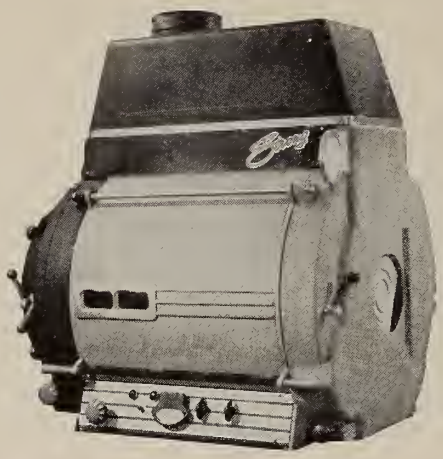
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VOLUME 36 NUMBER 9

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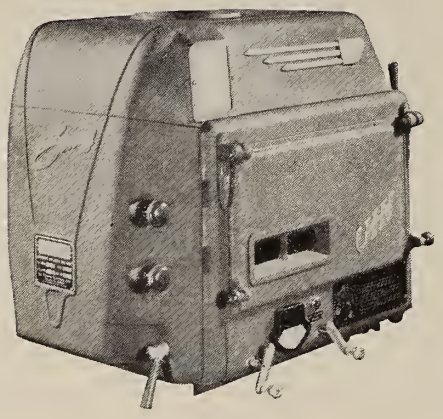
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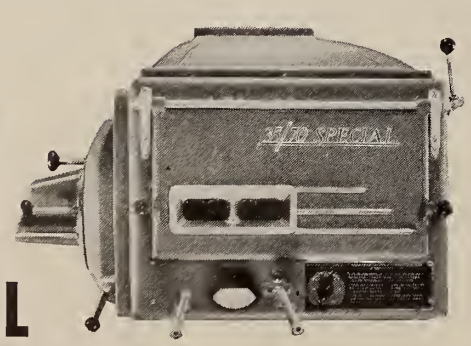
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EAST COAST OFFICE
545 Fifth Avenue
New York 17, N. Y.
Murray Hill 7-7746

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In This Issue . . .

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INTERNATIONAL PROJECTIONIST, published monthly by the Internationol Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneopolis 3, Minn. Subscription Representotives: AUSTRALIA—McGills, 183 Elizobeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, ond U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two yeors (24 issues). Foreign countries: $4.00 per yeor ond $7.00 for two yeors. Chonges of address should be submitted four weeks in advonce of publicotion dote to insure receipt of current issue. Second-class postoge paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personol opinions oppeoring in signed articles, or for unsolicited orticles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

LAND OF PLENTY

The United States is a land of plenty for projection equipment — at least that's the opinion of theatre owners and projectionists in some other parts of the world.

And they are right!

From the producers in Hollywod to the manufacturers of camera, lighting, projection and sound equipment, the U.S. has led the parade in the development of motion picture presentations. They have made available to exhibitors and projectionists every conceivable product needed in the advancing techniques of production and presentation.

Only when the American projectionist hears how difficult projection equipment is to come by in some other progressive countries, does he realize how fortunate he is not having to sweat out the details of designing a machine and building it to put on a better show to fill his pride in his craft.

For example, Doug Harley, who is president of the Auckland Motion Picture Projectionists, with headquarters in Auckland, N. Z., says he sometimes "envies the American projectionist who is able to walk into the various trade houses and pick up the necessary items to help you put over a better show."

He goes on to say that while New Zealand is not critically short of motion picture equipment it hasn't the abundance of items that are available in the U. S. He, a working projectionist, has, over the years, fabricated many machines, among them stereo devices (theatre owners there make a great deal of revenue showing advertising slides). He used surplus American or German low intensity lamps —converted to high intensity—with a 10" parabolic mirror, two plano convex condensers plus a slide carrier and a pair of single element lenses.

He is working on a good spotlight, one that can project a sharp edge spot. "Such units," he says, "are unobtainable here and with very few exceptions our legit shows use old type vertical arcs with short focus plano convex condensers. There are no Strong 'Troupers' down here." When you think that New Zealand isn't remote from world trade, one can realize that the United States, with its many equipment manufacturers and dealers, its service firms ready to deliver needed units to the theatre, is truly a land of plenty for necessary facilities for motion picture presentation.

The theatre owners, particularly, take this abundance for granted, with many of them pinching pennies instead of keeping their theatre situations up to modern standards as regards screen presentation. This discourages the manufacturer's enthusiasm for research and new develpoment by the seeming indifference of the people and the industry he wants to serve.

As a matter of fact, the theatre equipment manufacturer is largely responsible for the steady advance in motion picture presentation. He has come up with the needed machinery, from carbons to lamps to projectors to sound to screens, and all the associated units thereby necessary, during the long haul from hand-cranked machines to sound and bigger screens—including Cinerama, Cinemascope, and Todd-AO.

In addition, the manufacturers of raw stock and studio

(Continued on Page 18)

INTERNATIONAL PROJECTIONIST

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Simplified Arithmetic Figures Lens "Stretch" for Foreign Film

By JOSEPH HOLT

Member, IA Local 428, Stockton, Cal.

IN MANY situations, certain theatres find it necessary to augment their normal booking schedules with films which have been produced some years ago or filmed abroad where the widescreen aspect ratios are not customarily used.

For instance, it is rare indeed to find a foreign film which will compose properly at even so moderate a ratio as 1.66 to 1, and every conscientious projectionist and theatre manager should make certain that such films are properly screened. This being our resolution, the question that poses itself, is just how one may obtain the correct aspect ratio without a cumbersome method of trial and substitution.

The arithmetic method proposed here is one which may be used with confidence by any projectionist, for it is based solely upon the principle of ratios.

One of the principles of IP has been the simplification of complicated procedures in order that the widest possible use of the best tools may be found. We have devised the following steps with full regard for this principle.

It is our studied conclusion that the best arrangement in most theatres will require the uniform use of the same height picture for art films that is in use for the Cinemascope picture. This means that top and bottom masking need not be moved when changing from one aspect ratio to another.

Frequent observation leads to the recommendation that aspect ratio in the order of 1.4 to 1 are useful when screening older film or those made principally for foreign screening.

Let it be assumed than, that we wish to find the lens focal length and the aperture size which will produce this recommended aspect ratio in the theatre being considered.

The step-by-step procedure is this: multiply the Cinemascope prime lens focal length by the factor .83, and obtain an aperture the nearest available size under .550″ by .825″. This will allow in most cases for proper fitting of the aperture to the screen.

The size of .550″ by .825″ will satisfy most conditions where the projection angle does not exceed 8 degrees. In case of greater projection agle, it is wise to obtain an undersize aperture of around .800″ which will allow for the squaring of the projected picture by eliminating keystone, and most projectionists of any experience are aware of this necessity. It is mentioned here for the benefit of those who may have forgotten or may overlook it.

The final aperture size when properly fitted will be around .590″ by .825″, and this size when used with a lens of focal length as determined by the step suggested of multiplying the Cinemascope lens by .83 will produce a ratio of about 1.4

Let's look at some specific examples: if the focal length of the prime lens for Cinemascope is 5.00″, we would obtain a focal length of 4.15″ when multiplying by .83. This is almost exactly halfway between a 4.00″ and a 4.25″ lens. We believe in this case a 4.00″ lens would be entirely satisfactory, for we have seen cases in which such combinations are working perfectly.

A lens of 4.75″ for Cinemascope should be accompanied by a 4.00″ lens when art films are screened. All the figures given are predicated upon the use of an aperture of .590″ for the vertical dimension.

Cinemascope Lens	"Art" lens
5.00	4.15 (4.00″)
4.75	3.94 (4.00″)
4.50	3.74 (3.75″)
4.25	3.52 (3.50″)
4.00	3.32 (3.25″)

With the final fitting of the aperture to the masking on top and bottom, it is necessary only to provide for the movement of the side masking. This is a must whether it is provided by stage personnel or by remote control motor from the projection room, and any projectionist or theatre manager who permits the screening of even a short subject without proper masking on top, bottom and sides is guilty of a serious crime against the best standards of the industry. We are fully aware that the tilt and size of drive-in theatre screens frequently render size masking a difficult problem. This does not alter the fact that no picture can be presented properly unless the problem is surmounted. This writer has no immediate proposal for drive-ins—perhaps correspondents will show us the way. **iP**

National Carbon Appoints McCosh Market Director

NEW YORK — William C. McCosh has been named director of marketing for National Carbon Co, Division of the Union Carbide Corp. He succeeds Curry E. Ford who was recently appointed director of development for the company.



William McCosh

McCosh was graduated from the University of North Dakota in 1939, and joined National Carbon that year. Following several assignments in industrial sales, he was named manager of the central division of carbon products sales, with headquarters in Chicago, in 1954. In 1956 he was made manager of railroad and industrial brush sales in New York, and since 1960 he has served as manager of carbon products in the marketing organization. **iP**

Stanley Warner Circuit Adds Two Norelco Booths

NEW YORK—The Cheltenham in Philadelphia and the Warner's in Erie, Pa., both Stanley Warner theatres, are installing Norelco Universal 70-35mm projectors, it was announced by Niels Tuxen, general manager of the motion picture equipment division of North American Philips Co., New York.

These two theaters are the 13th and 14th in the Stanley Warner chain to have Norelco 70mm projection equipment. Tuxen added that almost 130 U.S. theatres are now equipped with Norelco 70mm equipment. **iP**

Water-Cooled Heat Filter Chills Widescreen Film Sizzle by 30-40%

By WALTER BEYER

The author, now chief of engineering research at Universal Studios, Universal City, Calif., has long been a contributor of technical improvements to the production and exhibition of motion pictures. He has worked at Paramount Pictures and was a staff engineer for five years with the Motion Picture Research Council. He recently completed a 32-city tour for Universal's release of the 70mm film "Spartacus."—Ed. Note.

Extensive tests and studies by D. & F. Products, Inc., in conjunction with the Motion Picture Research Council, have resulted in the design of an effective heat filter for motion picture projection and other applications.

"Heat-on-film" — an undesirable side effect and great burden in projection since the early days — became a more acute problem with the event of wide-screen projection systems and the need for increased light on the screen.

The studies conducted by D. & F. and the MPRC showed that poor focus is caused, to a certain degree, by film buckling as we know it throughout the years but the radiation of the arc light also produces a new phenomenon which is now known generally as "lens focus drift."

Color film, even when completely opaque, will transmit all the infrared to the projection lens. The lens elements, however, do not transmit infrared which causes them to heat up substantially and results in an effect almost comparable to a change in focal length. This, in turn, causes a gradual going out of focus of the picture on the screen.

This problem was solved entirely with the design of a ⅞" thick liquid heat filter, having a free opening of 5½" (Fig. 1). This free opening will accommodate the beam of any existing arc lamp (mirror and/or condenser type) as used for either 35 or 70mm projection. By absorbing the long wave infrared, which would heat up the lens elements, this filter eliminates lens focus drift almost entirely.

The filter consists of two Vicor plates with a liquid between them and has an outer hollow rim for the circulation of cooling water either from a recirculator or from tap water.

Its shallow construction and wide opening has no effect on the light distribution and does not upset the illumination system of the lamphouse. The liquid heat reducing filter (Fig. 2) mounted on the front of a lamphouse with the hoses for circulating water connected on top.

Tests and measurements in the field have shown that the temperature in the center of a projector gate is as high as 1600°F and that the liquid heat filter will reduce this temperature by at least 30 to 40%.



Fig. 1 — ⅞" thick liquid heat-reducing filter produced by D. & F. Products as it appears ready for installation.

This heat filter can also be delivered with an additional heat-reflecting coating on the Vicor plate away from the arc toward the film. This dichroic coating will absorb the short wave infrared and protect black-and-white film and prevent it from buckling. This means a tremendous improvement in overall picture quality. Since this filter is practically permanently cooled it will last forever and not deteriorate as is mostly the case with heat-deflecting plates placed in the light beam, inside the lamphouse, where no cooling can be provided.

The liquid heat-reducing filter can easily be installed on any lamphouse presently in use. Instructions for mounting, water connections, and maintenance are supplied with each filter.

This new liquid heat filter is an outstanding combination of careful investigation and the needs in the practical field of motion picture projection. It has proven to be most useful and successful during long-range tests conducted in the field.

Hard-top theatres and drive-in theatres which want to improve the quality of their picture presentation will benefit immeasurably with the installation of the D. & F. liquid heat filters.

Even though designed for powerful light beams of arc lamps in motion picture projectors, the liquid heat-reducing filter is a more versatile accessory. Due to the ease of installation, and its effectiveness, it can also be used to protect, for instance, gelatine filters in printers, still plates and/or films in stereopticans, and is naturally useful in micro-photography where arc lamps

(Continued on Page 18)

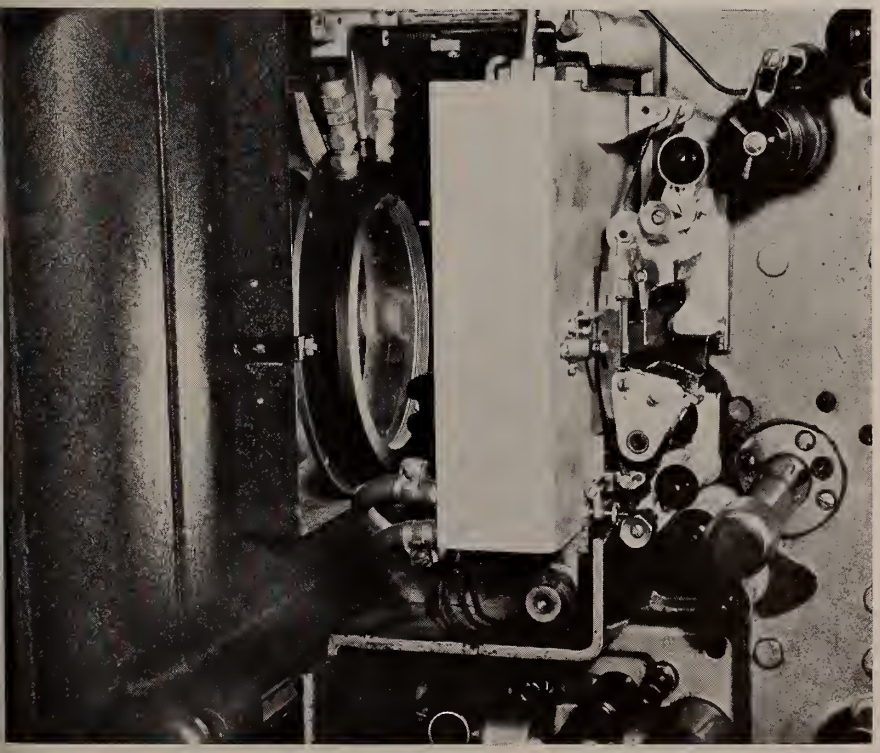
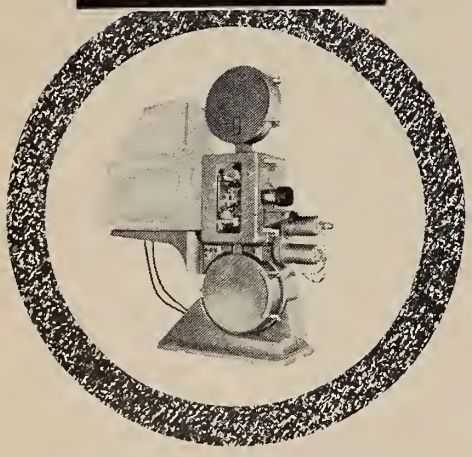


Fig. 2. — Liquid heat-reducing filter completely installed on a 35/70mm projector lamphouse showing connections for water circulating hoses on top.

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ENTERTAINMENT ALOFT — Inflight Motion Pictures inaugurates the showing of first-run films on transcontinental aircraft. Fully-automatic unit weighs 70 lbs. with film tor 135-minute show. IATSE projectionists locals to provide service at airport layovers.

Equipment for Movies in the Air Took 5 Years of Engineering Work

Behind the screen entertainment now enjoyed by passengers on transcontinental planes flying coast-to-coast are the accomplishments of engineers and technicians who had to design and build machines for automatic screening of feature pictures with the equipment limited as to its weight and size.

Service in transcontinental planes started in mid-July by the Inflight Motion Pictures Inc., whose president is David Flexer, of The Flexer theatre circuit, in Tennessee, Mississippi and Arkansas. Five years have elapsed since Flexer started his enterprise and received approval of Federal Aviation Agency. Before the start of Inflight's service, Flexer made deals with the major film distributors for new pictures to be shown to plane passengers.

Projectors and sound are fully automatic. A switch on the flight engineer's control panel sets the projectors and sound in motion, with the film threaded and ready for two hours and fifteen minutes of screen presentations in all aspect ratios.

Inflight has signed a contract with IATSE whose locals will asign member projectionists at terminal airports for servicing the machines — oiling, adjusting, rewinding, threading, etc.

The special 16mm projector fits into a Retrofit kit, 3′ x 3′ x 1′ and is built into the ceiling as a permanent part of the plane. The projector weighs 60 lbs., fully-loaded reels adds another 15 lbs. The projector operates on 400 cycle current, standard on the aircraft, and is equipped with automatic safety devices, which go into operation if the film breaks, if there is malfunction in the motors, or if the special cooling system fails. When the show is completed the projector is automatically shut off.

The screen is 24″ x 48″ in dimension, weighs three pounds and is lenticular in construction. It is tilted in position for viewing from every seat in the cabin and its picture quality is not diminished by aritficial light in the cabin nor by full daylight. The cabin is not darkened during the shows.

Earphones, sterilized and sealed in plastic containers, are provided for every passenger on the plane who wants to hear the show so the sound will not disturb passengers who would rather talk, read or sleep. Earphones are especially designed for the ambient noise level of jet travel, and their total weight is a fraction under one ounce. The earphones are plugged into a jack which supplies a volume control for adjusting the sound level.

Inflight's motion picture sound system is independent of the aircraft's central speaker unit, but once it is in operation, any message from the captain or the plane attendants can be helped in if desired.

The Inflight company has plans to extend its service for film entertainment on planes flying overseas. Presently, programs are being changed weekly. Most of the programs are first-run features, mainly Hollywood product with the overseas films with English dialog dubbed in.

iP

Klapholz, New York City Veteran, Claims Rural Jobs Develop Resourceful, Ingenious Boothmen



MORRIS KLAPHOLZ

Like so many veteran porjectionists, Morris I. Klapholz — a full-fledged operator in 1908 — says that now the best new projectionists are those who have jobs outside the big cities.

"They don't get the help from the equipment company technicians, equipment dealers or fellow local members, which is available to the big city projectionists. They have to put on the show whatever the difficulties they encounter."

Although Klapholz started in projection as a schoolboy in Keene, N. H., (first as a reel boy and at 17 the projectionist in that small town theatre), Klapholz has been in New York City since 1909 and now works a shift at the Capitol theatre.

He came to New York intending to take a pre-medical course, but abandoned the idea of becoming a doctor and started working as a projectionist, and in 1913, when the Palace installed the Edison Kinetophone, got a job running the machine which played a phonograph synchronized with the pictures on the screen.

Klapholz became so skilled at operating the Kinetophone, with its silk cord running from the booth to the phonograph behind the screen on the stage, that J. J. Murdock, executive of the Keith Orpheum circuit, sent him out of town to deliver reels and the accompanying phonograph records to theatres.

"I had to collect the money for the reel before I gave it up," Klapholz recalls. He also instructed the local operators who would put on the show. This was quite a trick in itself, for the cords and pulleys running from one end of the theatre to the other, unless precisely installed and manipulated would go out of sync. If the cord broke there would be no sound.

His experience with these early talking pictures led to a post with Dr. Lee DeForest who invented the audion in 1907 and set up his Phonofilm company in 1923. He was with DeForest for nine years, taking shifts at theatres in New York to supplement his income.

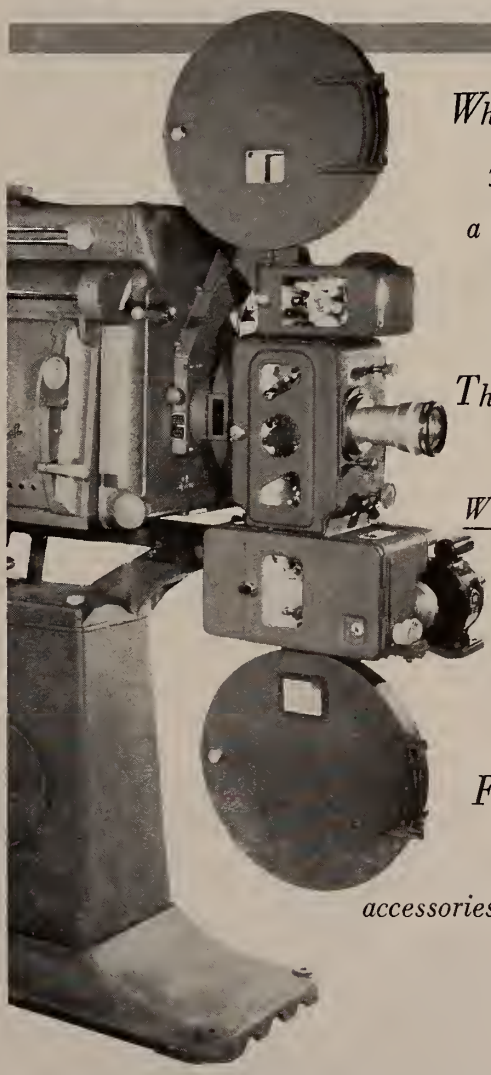
"The company was struggling at the time when modern talkies were being developed," Klapholz said.

Klapholz has been a projectionist at the Capitol Theatre for 13 years, as a part-time worker and a full-time operator. He was at the Capitol before the Loew's Theatre circuit put in the stage equipment (elevator for band shows, turntables for variety acts) and left for six years after the Capitol reverted to a pictures-only policy.

He is a charter member of New York's local 306 and was secretary of the auxiliary of local 35 under which projectionists were admitted as "spotlight men" of the New York theatrical union. He has held a prominent place in the Twenty-Five-Thirty Club, which was instituted in 1939 in New York, having served as secretary and is now

(Continued on Page 11)

WESTREX SOUND SYSTEMS



Whatever the size of your theatre, you will find in the Westrex line a high-quality sound reproducing system which exactly meets your needs. The Westrex Economy is ideal for smaller theatres. Choose the Westrex Advanced for the highest quality in the medium-price range. And for the finest that money can buy, there is the incomparable Westrex. For information on these systems —or on projection equipment, accessories, and service for your theatre— contact Westrex or one of its subsidiary companies.

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General Films' Quality Control:

Skilled Personnel, Special Equipment Guarantee Low Print Rejection Rate

The following article was written in Hollywood, Calif., by General Film Laboratory's chief projectionist, Don Kloepfel, for the firm's house organ "Rewind" to explain GFL's philosophy, methods and equipment in connection with film inspection. Inspection plays a vital role in maintaining a laboratory's quality reputation. We thought you might be interested in this inside look and we are grateful to GFL for reprint permission.—Ed. Note.

By DON KLOEPFEL

Recently I visited one of the bottling plants of a well known soft drink company, world famous for the consistent high quality of its product.

Through the years this company has developed automatic inspection machinery designed to maintain that high standard. As the filled bottles move down a conveyor belt, a light beam passes through each bottle and actuates a photoelectric cell. If the liquid is too light or too dark in color, a device automatically ejects it from the conveyor. Should a bottle be chipped or broken, the capping mechanism sets into motion another ejector and the bottle is removed from the line. Throughout the plant other automatic or semi-automatic devices perform their task so well that the quality of the soft drink never varies.

Would be that motion picture prints could be inspected as simply, and economically. Unhappily, the proper inspection of motion picture film can not be this thoroughly automated. Unlike the soft drink, motion pictures necessarily vary from product to product, even from frame to frame. Contrast, density and hue set the photographic mood and the film must convey the message of its maker to the audience. without distortion.

Motion picture production is a complex operation. Mechanical and human errors can occur anywhere from the camera to the screen, and the processing laboratory is itself vulnerable. Although rigid controls are maintained throughout the laboratory operation, one of the most important jobs in control is the inspection of prints to check up on the final screen product. Some physical defects are easy to detect, such as scratches or torn perforations. Other defects may be more subtle. The experienced inspector must be able to judge contrast, density, color balance and hue. He must detect and identify water spots, chemical spots, printer streaks, negative fine grain or positive dirt and scratches, lack of resolution or sharpness, excessive grain, jiggle, flicker, weaving or breathing.* After identifying the defect, he must be able to trace it to its source, or bring it to the attention of someone else to identify and rectify — and take action to prevent a re-occurrence of any similar defect.

The most complete and satisfactory method of inspecting a motion picture print is to view it as it is projected on a screen under controlled conditions. The American Standards association has approved certain proposals usually by the SMPTE pertaining to safe title area, aperture sizes, screen brightness, color temperature, perforation dimensions and the like. A variety of inspection projectors designed for operation under these standards have been built by General Film Laboratories for the specialized purpose of inspecting motion picture prints. Such complete projection inspection has made it possible for GFL to maintain one of the lowest print rejection rates in the industry.

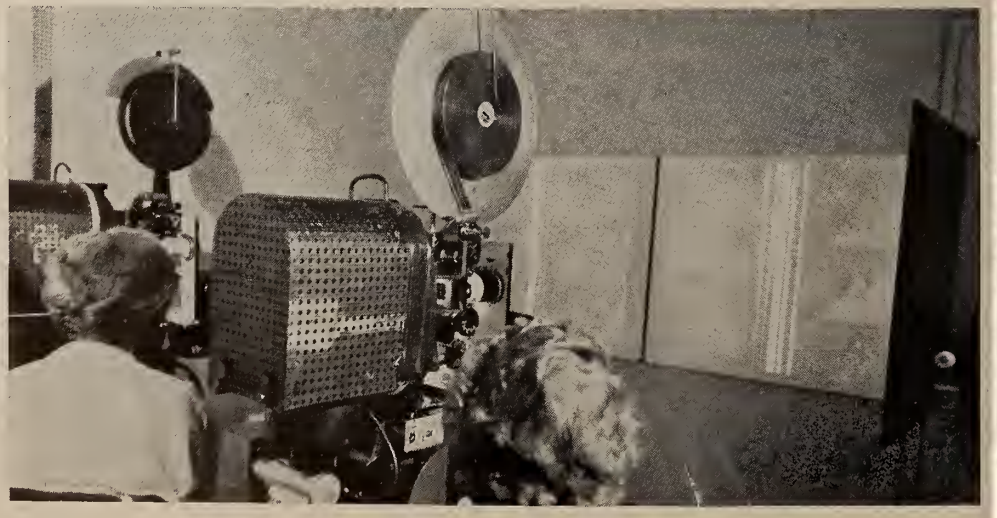
You may be interested in our inspection equipment and procedures, since these are involved in inspecting your prints.

The great majority of release footage today is in the 16mm width. However, original production is in both 35mm and 16mm, and release widths include 35mm, 16mm, and 16mm positives printed on 35/32mm stock. In the near future we'll also be producing 8mm release on the 35/32mm width. Therefore, in order to check on our quality control, great quantities of daily and release prints — plus short spot commercials — must all be projection-inspected. In rare instances, fine grain positive prints (from which negatives are to be made) are projected for inspection. At the producer's request, or with his permission, even negatives are projected — when such inspection is required.

First, let's outline the inspection of 35mm materials.

Exposed 35mm camera negative, usually arriving at the laboratory in the evening, is developed and a print called a "daily" is made that night,

**Ed. Note: Good heavens! With all the potential defects, how is it possible to produce a good print?*



Two of General Film Laboratory's 35-32mm inspection projectors in action. Double-print viewing cuts hour screening time to 13 minutes for inspection.

and viewed early next morning. The processed camera negative daily totals hundreds of thousands of feet. To view the daily prints from this vast footage on a screen at normal projector speeds would not only be uneconomical, but would also delay delivery to the customer. However, keeping a consistent check on quality demands that it be viewed. For this purpose General Film Laboratories designed special high-speed projectors with oversize sprockets and special intermittent movements. The film magazines were replaced with large flanges to expedite the handling of film mounted on spools rather than on reels.

These projectors operate at 180 feet per minute (compared to 35's projection speed of 90 feet per minute) and in some instances as high as 265 feet per minute. The incandescent lamp voltage is varied with an auto-transformer to maintain uniform brightness at the different speeds, and screen readings are made with a meter which measures screen brightness in terms of "foot-lamberts". This brightness level is held rigidly to ASA standards. With these machines operating under known conditions, skilled inspectors can spot a defect and determine its cause very quickly. If processing is in any way at fault, a reprint is ordered immediately.

Review room equipment is much the same as that found in a modern theatre, except that additional equipment is also installed, such as magnetic soundheads, dual film magazines for handling films with separate sound tracks, and special devices for controlling brightness, sound reproduction, and color temperature of color prints. Such devices aid in simplifying motion picture production, and are used not only as an aid to processing, but also as a service to the customer — even after his picture has been completed.

From the original camera negative a fine grain positive print may be made, from which duplicate negatives will subsequently be printed. Because it will be used to make dupe negatives, special care must be exercised when handling a fine grain print. When projection is necessary, we use special projectors with polished chrome rollers and plastic film guides and rails. These same machines can be used to project negative, safely.

After the negative is assembled into the final picture form, a timed and corrected "first trial" print is made — a composite print with sound track, titles, dissolves, fades and effects incorporated. Before it is projected, screen brightness is read, and sound level and frequency response checked so that the print with be heard and viewed under known and controlled conditions. After the first trial is approved by laboratory and producer, the order is given for release prints.

Every 35mm release print — color or black and white — is projection-inspected on projection machines similar to those already described in connection with inspecting dailies. The high speeds of the machines make possible a large output.

Unlike 35mm production, which exposes a negative in the camera and — directly or through intermediate stages — results in a positive print, 16mm production mainly exposes a reversal-positive stock in the camera** and then goes to either a reversal print, or a positive print through an intermediate negative. Therefore, even though the inspection methods for 16mm film are much the same as those for 35mm, there are certain differences — variations worked out to suit the type of material and the producer's needs.

16mm black-and-white camera originals — reversal or negative — are processed by the laboratory. 16mm Ektachrome is processed in the Eastman Kodak Hollywood laboratory, on an overnight schedule. Then the 16mm work prints*** are made, and projection-inspected on standard projectors before shipment.

The first trial prints are inspected on heavy duty Eastman Model 25 projectors, in customers' viewing rooms, but release prints may receive a different type of inspection, depending on the form of release.

Since the great improvement in the 16mm color internegative-positive print materials, the greater portion of color release has been in positive, rather than color reversal. In 16mm black-and-white positive release has been standard for many years.

When the original is 35mm negative, the release order may call for prints in 16mm size as well as 35mm. In that case, a 16mm first trial must be made and screened for the laboratory and customer, again under rigid ASA standards.

Most 16mm positive color or black-and-white release at General Film Laboratories (from either 35mm or 16mm originals) is printed on 35/32-

(Continued on Page 16)

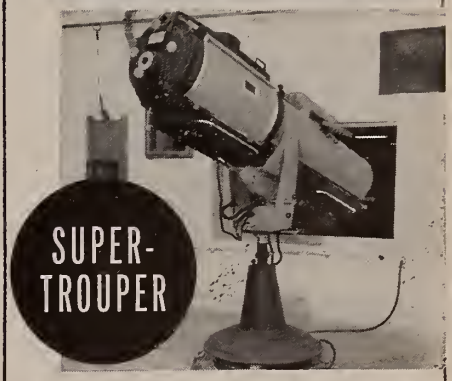
*** To supplement this statement, there is a respectable volume of 16mm B/W negative exposed, particularly for television and sports films.*

**** In 16mm work, the dailies are usually known as workprints.*

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Up to 15 times brighter. Exclusive lens system eliminates woste of light.

Cut operoting costs as much as 73%.

Require no extra equipment. Simply plug into 110-volt A.C. outlet.

Strong Arc Spots are the only ones with on automotic carbon feed which maintoins constant uniform orc gap thot ossures a perfect focus ot oll times.

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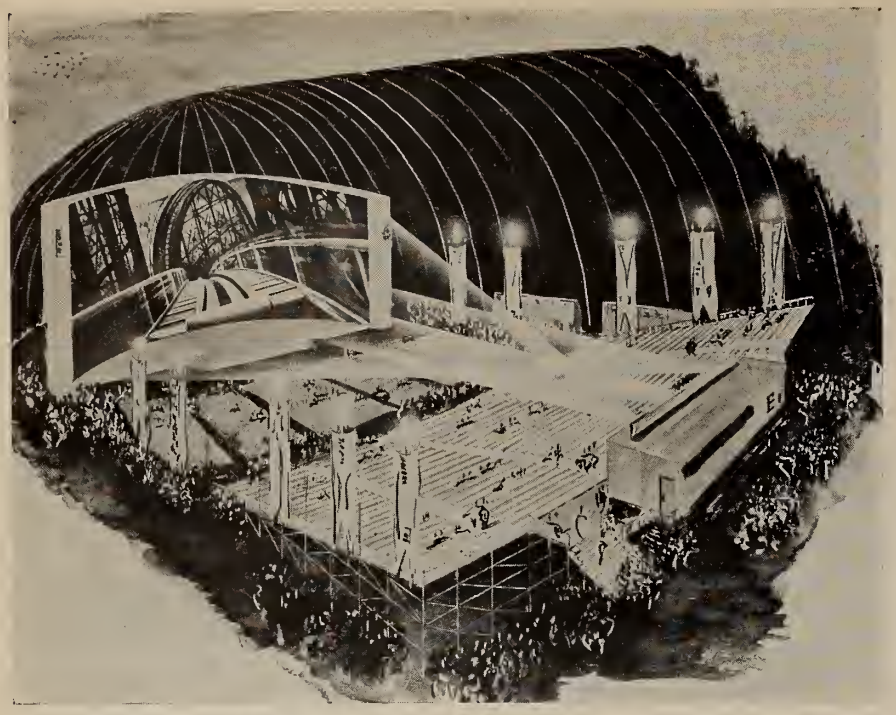
All controls are on the operoting side.

Write for brochure ond dealer's nome, giving length of throw.

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ROAD SHOW — An artist's conception of Itinerama, the modern-day travelling tent show which started its first Cinerama tour at Angers, France, this summer. The sketch shows a segment of the 210 x 144 x 62-foot inflatable plastic balloon-type tent theatre; its 3,000 seats, trailer truck booth for the three Cinerama projectors, the 100-foot curved screen and the interior light towers. Each of the three travelling units on the road is carried in a 40-truck caravan. Additional equipment (not shown) includes generator, air pumps, rest rooms, ticket booth and kitchen and sleeping accommodations for the operating crew.

Inflatable Balloon-Type Cinerama Theatre Starts European Tour

ANGERS, FRANCE — There may be no menagerie, no "geeks," no sideshows, but the tent shows which took to the road this summer from this French city to traverse the European countryside claim for themselves the distinction of being the electronic descendent of touring circus.

Itinerama, under the direction of Maurice Dollfus, executive vice president, has launched three 40-truck caravans each carrying a 3,000-seat inflatable balloon-type theatre.

A licensee of Cinerama, Itinerama's three completely portable motion picture theaters will simultaneously criss-cross France, each unit to show a different Cinerama picture. Each caravan will consist of the inflatable theatre, a 100-foot curved screen, a full-sized projection booth to house the three Cinerama projectors, the new all-transistor sound equipment, rest rooms, ticket booths, generators, and full kitchen and housing accommodations for the 50 man crew. The fire-proof balloon-theatre can be completely inflated in fourteen minutes and the entire setting-up operation is completed in four and a half hours and dismantled in three.

It was estimated that each of the three French travelling motion picture theatres would play to about two million (2,000,000) persons each year in France alone. The average ticket price is $1.25, offering a combined potential gross of seven and a half million dollars ($7,500,000) for the three units.

Dollfus outlined Itinerama's plans at New York meeting earlier this summer. "This revolutionary concept of exhibiting motion pictures is in the time-honored, traditional style of touring companies of entertainers, bringing their shows to the people of Europe's villages, towns and cities. Only now, it is the wizardry of the 20th-century — Cinerama. I believe that in America it would be in the tradition of your showboat and circus," Dollfus said.

Itinerama is licensed by Cinerama films in France and the French speaking countries, with options for Germany, Italy, Great Britain, Belgium, Holland, Sweden, Denmark, Norway, and Spain. Itinerama was financed by private interests, one of whom is Europe No. 1, the most powerful radio complex in Europe. Although he could not speak officially for any American company, Dollfus was of the opinion that mobile Cinerama would be touring America in 1962. **iP**

Kodak Enlarges Its Facilities in Canada

TORONTO — Expansion and modernization of existing office facilities at the Toronto headquarters of Canadian Kodak Co., Ltd., "reflect the company's faith in the future of the photographic industry" according to Donald C. Kerr, president and general manager of Eastman Kodak's associate company in Canada.

In announcing the company's plans, Kerr noted that the new building would "provide more adequate accommodations for Canadian Kodak's growing operations." Two top floors will be added to the present office in Toronto. The other three floors will be completely renovated.

This is the third major capital improvement undertaken by Canadian Kodak in the past three years. A new building now houses all finishing operations in the production of photographic paper. Earlier this year, a processing laboratory was opened in North Vancouver, B.C., and current plans call for the addition of a central distribution center in Toronto, construction to begin late this year.

Canadian Kodak is one of five manufacturing companies operated by Eastman outside the United States. Others are located in England, France, Germany, and Australia. During 1960, these Kodak associate companies invested $18 million, almost entirely from their own funds, in additional production facilities, improved processes, and new equipment.

The Canadian unit produces photographic films, papers, chemicals, and related equipment for amateur, professional, and commercial markets throughout Canada and around the world. Its renovated office will be one of 10 buildings located on a 45-acre site in suburban Toronto.

iP



Recent installation of equipment for the presentation of Cinerama productions at the Rialto theatre, Louisville, Ky., included Strong projection arc lamps. The booth is manned by Al Greer, Mike Hellmann and I. C. Gousiha of local 163, IATSE. **iP**

KLAPHOTZ . . .

. . . Continued from Page 7

editor of the Club's Official Bulletin.

It's anybody's guess why veteran projectionists such as Morris Klapholz insist that motion picture operators outside of the big cities are more resourceful than those that work in metropolitan areas. Perhaps it's nostalgia as they look over their careers up the years when the modern machines were developing in the industry. Then again it could be that these projectionists had practical experience in getting around difficulties when there was no technician nearby and were remote from equipment replacement so necessity, being the "mother of invention," stimulated their imagination and mechanical ability to patch up whatever interfered with the show getting on the screen. In other words, they remember when you couldn't get quick service by calling up a nearby equipment dealer, the representative of an equipment manufacturer, or a service firm to get advice or a new part.

iP

Portman Sets Nov. 10 Date For Animation Workshop

NEW YORK—The second annual Portman Animation Seminar and Workshop will be held here Nov. 10 to 12, 1961, and in Hollywood Jan. 12 to 14, 1962.

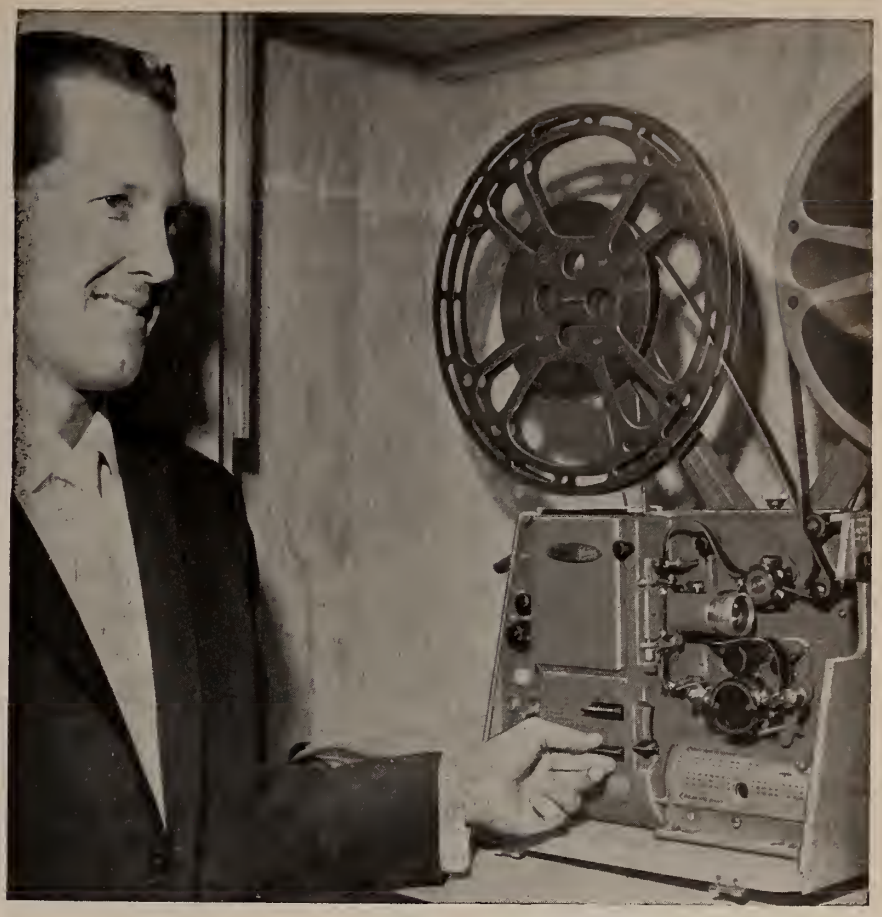
Originally conceived and directed by Warren C. Portman, last year's conclave brought together many serious exponents of the art. Some who came to lecture or observe remained through all the sessions. There was no charge for the series and a repeat paid performance was requested by many who attended.

Portman, president of Photo Animation, Inc., decided to continue the workshop as an annual free service to the producers of animated films, TV commercials, industrial in-plant producers, cameramen, directors, universities, government agencies and the military.

The seminar will include all practical phases of basic artwork including hot press titling, complete camera operation, three dimensional and multi-plane techniques, modern high speed animation, and filmstrip processes.

Attendance will be limited to 100. Those interested must register promptly with the host, Joe Sanford, S.O.S. Photo-Cine-Optics Inc., 602 W. 52nd St., New York 19, New York for the east, and Alan Macauley, 6331 Hollywood Blvd., Hollywood 28, Calif., for the west.

iP



."We Make Sure Our Training Sessions Run Smoothly by Using Kalart/Victor Projectors..."

"The way we use 16mm sound films," continues Mr. Al Tinker, President of Tinker Kirby Nassau Company, Inc., "we need a projector that is dependable at all times. Films play a big role in our program of training men how to sell Kirby Home Sanitation Systems. When we schedule a training session, we want to know that the projector will do its job at the flip of a switch. Our Kalart/Victor fills the bill on this count, and many more besides."

A company such as Tinker Kirby Nassau, with so much at stake in its training program, particularly appreciates the fact that Kalart/Victor projectors are engineered to provide trouble-free performance in continual daily use.

Simplicity of threading, ease of maintenance and protection against film damage are other important features that Mr. Tinker looked for —and found—only in Kalart/Victor.

Three-step threading with color-coded path showing sequence and location makes it easy for nearly anyone on Mr. Tinker's staff to set up a Kalart/Victor. Safety Film Trips, a Kalart/Victor exclusive, prevent damage to valuable training film. And a large-capacity oil reservoir built into the Kalart/Victor means that lubrication is necessary only once a year.

What features are you looking for in a 16mm sound projector? Great picture quality? Magnificent sound reproduction? Adaptability for magnetic recording and playback? Kalart/Victor has them all. Call your Victor Dealer for a demonstration.

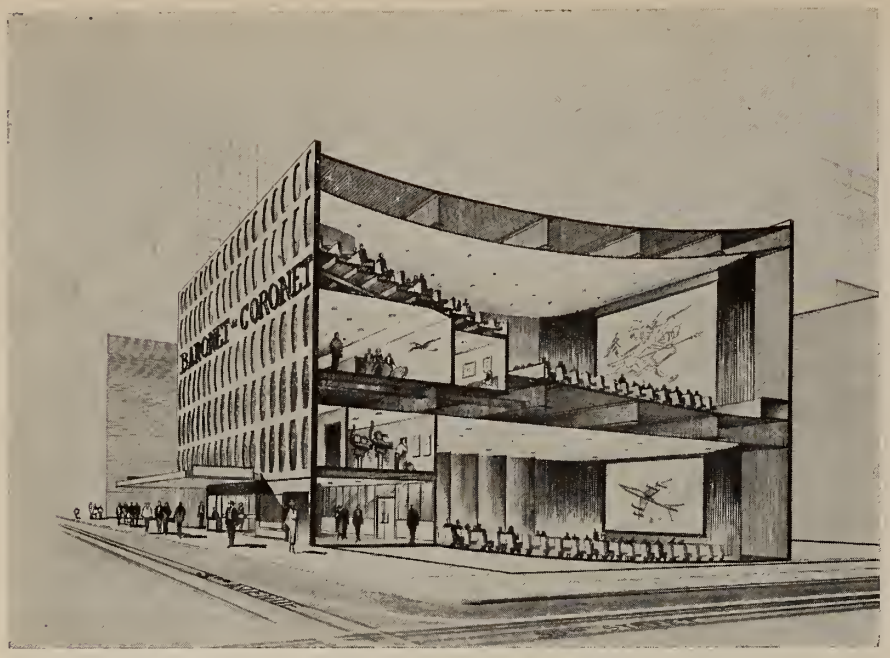
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"PIGGY-BACK" THEATRE — Artist's sketch of proposed contruction on new Coronet theatre atop existing Baronet art house in New York. Dual house will be owned and operated by Walter Reade Theatres.

Reade Circuit to "Piggy-back" New Coronet Atop Old Baronet

OAKHURST, N. J. — Plans for a $1,500,000 theatre construction and reconstruction program will turn the present Baronet theatre, Third Ave. and 59th St., New York City, into a "cinema-atop-a-cinema" to be known respectively as the Coronet and Baronet theatres, it was disclosed here by Walter Reade, Jr., president of Walter Reade circuits which owns and operates major theatres in New York and New Jersey.

The Baronet theatre will undergo extensive interior and exterior renovations, and the new Coronet will come into being atop the present cinema. John J. McNamara, New York theatre architect, has designed the Coronet as a motion picture theatre which will embody several new ideas in cinema construction.

An "air curtain," marking the first of its kind for theatre use, will do away with the conventional door fronts. As conceived, the "air curtain" will provide a controlled temperature area leading from the street into the theatre proper. Use of extra open space provides additional lobby area room.

To provide easy access to the upper floors of the Coronet theatre, a new escalator will be installed. Instead of the usual concave or straight sloping ceiling that is found in most theatres, the Coronet will feature a convex ceiling that provides greater acoustic clarity as well as a more effective usage of the picture "throw" from the projection room. A hinge design will allow for the top of the mezzanine to be below the height of the average balcony.

The Coronet auditorium, seating approximately 600, will be on the stadium plan, and the remodeled Baronet will be a one-floor construction with its own new lounge and rest rooms. Each theatre will have its own box office and entrance. Both theatres will share a new front of a terra cotta honeycomb design. The upper level fronting the Coronet promenade will be covered with tinted glass and decorator draperies during the day, which will be opened during evening performances. A newly designed marquee in keeping with the exterior decor will cover both theatre entranceways.

The present Baronet theatre developed from a neighborhood house known as the Arcadia when it was taken over by Reade in 1951. Extensive remodeling turned the Arcadia into the modern Baronet, a leading first-run art cinema.

Reade, foreseeing the trend of foreign language and art cinema patrons toward the east side, has long been searching for new theatre sites in this area. The scarcity of available properties and the tremendous expense involved in building construction prompted the unique idea of building the new Coronet atop the Baronet theatre. There are many advantages in operating the theatre-atop-a-theatre, according to Reade: convenience of performing times, utilization of increased capacities when required and economy of operation. **iP**

Century Equipment for Palace in Venezuela

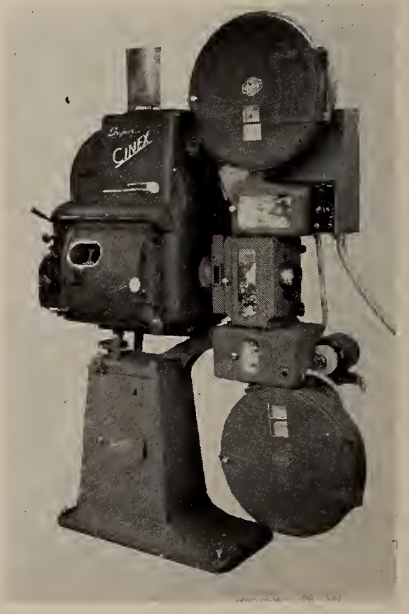
NEW YORK — Century Projector Corporation announces that Century 70-35mm projectors with 6-4-1 channel all transistorized sound reproducing equipment has been shipped for installation in the Presidential Palace, Caracas, Venezuela.

The sale was consummated by Century's foreign distributor, Westrex Corp. Installation and service will be handled by the Westrex office in Caracas.

This new equipment, shown in the accompanying photographs, represents the latest and most modern advances in motion picture presentation. The sound reproducers have the now well known hydroflutter suppressors which won Academy of Motion Picture Arts and Sciences acclaim for improved sound reproduction in studios and theatres. The same principles and equipment are used in many studios for recording as well as for reproducing.

The amplification being all transistorized is easy of installation, sturdy, quiet and fool-proof. It has the now proven system of electronic switching thereby eliminating a major source of trouble. There are no relays or switch contacts in the voice circuits.

The new 6 channel all transistorized power amplifiers are self-powered and individually adjustable for volume out-



S.A. INSTALLATION — Century Projector Corporation's equipment is being installed in the presidential palace at Caracas, Venezuela. Above, front view of 6-4-1 channel system mounted on Century's 70-35mm projector. Westrex is handling foreign sale and installation.

(Continued Next Page)



AMPLIFIER PANEL — The Century six transistor power amplifiers (above) are shown in a wall amplifier cabinet with its cover open. Other units housed in the unit (concealed by drop door) include exciter lamp, power supply, amplifiers, non-sync control, system supply-electronic switching amplifiers.

put. Each amplifier is interchangeable with the other amplifiers by the easy substitution method thereby eliminating troublesome switches, complicated wiring, etc.

The same equipment is available domestically for small theatres (up to 800 seats) and for review rooms where space may be a problem. The entire wall space required is only 17" x 34" including all power supplies, exiter lamp power, switching, 6 channel magnetic, (TODD-AO), 4 channel magnetic, (Cinemascope) and regular single channel optical reproduction, complete with power amplifiers.

As this represents the first foreign installation of an all transistor 6-4-1 channel sound reproducing system it marks another milestone in the never ending search for better, more reliable, improved quality American-made motion picture products. **iP**

CHARLES F. WHEELER

GENEVA, N. Y. — Charles F. Wheeler, secretary-treasurer of the New York State Association of Motion Picture Projectionists and a member of local 108, IATSE, died here recently. He is survived by his widow, Lillian. **iP**

LOUIS G. COWAN

MINNEAPOLIS — Louis G. Cowan, a charter member of local 219, IATSE, and retired projectionist at Minnesota Amusement company's Lyric theatre, died here late in August. **iP**

BalCOLD® REFLECTORS CUT HEAT IN HALF

Read this Hollywood test report. "Film gate heat at 1.85 aperture, is 280° F. with silvered reflectors, but only 140° F. with BalCOLD." And look at the benefits when BalCOLD Reflectors cut heat in half:

NO FOCUS DRIFT. As much as 5400 feet of film have been run *without* refocus. Cooler film gate cuts down film bulge—keeps constant focus.

GREATER DEPTH OF FIELD. Less film bulge means better background resolution, color fidelity, and clearness of detail.

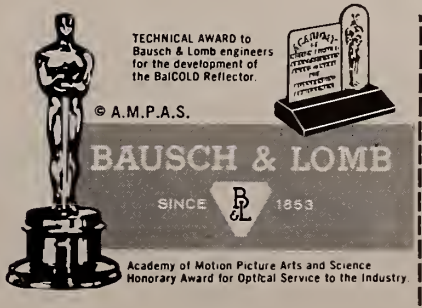
NO END-OF-REEL CONTRACTION. Lens and projector parts can't cool off and contract (thus changing focus) because BalCOLD Reflectors don't let them get hot enough to expand!

NO EMULSION PILE-UP. Green film never gets hot enough to leave emulsion coatings on film tracks and shoes.

LONGER REFLECTOR LIFE. Theatres all over the country report up to 17 months and more constant, top-quality performance.

LONGER FILM LIFE. Theatres report film life doubled with BalCOLD Reflectors. Means a lot when prints cost up to $10,000 ea.

Next time you replace silvered reflectors, replace them with BalCOLD—the only reflector whose proven contribution to the advancement of motion picture projection has won for its designers the highly regarded technical award from the Academy of Motion Picture Arts and Sciences.



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Tape Recorders Used in Background Music Systems Deserve Top Maintenance

In more and more theatres lately, the use of recorded music for prescreening listening, utilizing the theatre sound system or independent for the lobby, is becoming more prevalent.

Too, music on records is gradually giving way to tape recording selections, since very little attention is required once the projectionist is supplied with a tape of selected music. This means that he no longer has to fool with records, interrupting his preparations for the evening's screenings to lift needles, watch records or otherwise do work which was not intended he do.

Most projectionists are perfectly willing to assist in the utilization of the theatre sound system for such background music, since they as well as the exhibitor knows that what is good for the customer is good for them.

However, by the same token, if the sound is sloppy, if the music is out-of-date or badly selected, or if the presentation is technically faulty the original purpose of bringing people into the theatre is forgotten and the customer is left with the feeling "if this is what they do to good music what will they do to the picture I am about to see?" The same feeling will exist in the Audio-Visual classroom.

As the art theatre grows in popularity, as the coffee break and the use of the theatre lounge becomes more important, the use of background music will become more important and it will fall on the projectionist to handle the sound, either by arrangement or because he is a good fella.

The proper care of a tape recorder is quite simple, obviously so since there are millions of completely unskilled people working these machines throughout the country today. Their sound is becoming increasingly bad, however, because they are not giving them the proper care and cleaning, preventive maintenance, or they do not have a good recorder to begin with.

The following hints will assist any projectionist or audi-visual specialist in maintaining his tape recording equipment in the proper condition whether it be used for theatre broadcasting or for audio-visual accompaniment.

These points to watch may assist in the preparation of a check list to provide the basis for a regular program of maintenance which will do the required job of keeping the customer satisfied, whether he be a theatregoer or the recipient of audio-visual instruction.

Let's think about that phrase preventive maintenance for a second. It means preventing below-par performance by following a regular schedule to keep the equipment in top condition — to prevent low quality sound and operation by proper maintenance.

The quality of frequency response and the absence of distortion depend on the guides, the capstan, the idler wheel and the heads, with all of these parts sharing responsibility for faulty performance.

These danger areas build up dust, dirt, oxides, grease, leader binder and the like as the tape passes through the machine. If these dirty particles hang into the head gap they will result in considerable loss of high frequency. Eventually the accumulation of oxides and material sluffed off the tapes will block out the high frequencies altogether.

The tape itself causes considerable head wear, regardless of what the tape manufacturers say. It is obvious when you consider that magnetic recording tape is coated with iron oxide which is the next thing to jeweler's rouge — and that is used for polishing metal. The metal sandwiches of the recorder head are gradually worn by the deposit and abrasion of iron oxide of the tape, resulting in a widening of the head gap and consequent distortion.

Wow and flutter will be increased when the grease and resinous sluff off the tape becomes built up on the capstan and idler wheel. (Don't forget that the fingers of the operator can deposit grease on these two surfaces almost without thinking, and if there is grease on the capstan rod or, worse, on the idler wheel, there will be considerable slippage of the tape.

It is consequently always a good practice to clean the tape itself with a soft cloth occasionally during rewind, and of course it is necessary to keep the machine itself and particularly the recording head area clean, either by touching up with carbon

(Continued on Page 17)

4,635 Churches Request MGM "King of Kings" Film

NEW YORK—The special religious film strips produced by the Society for Visual Education for MGM's "King of Kings" have received such an exceptional response that requests have come in from uncanvassed overseas areas.

Among the 4,635 requests from Catholic and Protestant churches were orders from the Chikore mission in Southern Rhodesia and St. Christopher's church in Kailua, Hawaii.

The film strips are part of the massive promotion campaign in churches, religious organizations, and schools.

iP

Lloyd Seidman President Of Teaching Machine Co.

NEW YORK — Lloyd Seidman, long-time executive with Donahue & Coe, Inc., a New York advertising agency, is to head a new teaching machine company here. His appointment as president of the Educational Science Division of U. S. Industries, Inc., is announced by John I. Snyder, Jr., chairman and president of USI.

Under Seidman, the new division will create and market Tutor-Film programs for the AutoTutor teaching machine produced by the Western Design & Electronics Division of USI and will also produce the TutorText programs published by Doubleday & Co.

iP

• BRIGHTER LIGHT
• LONGER BURNING
• SHARPER PICTURE
Free Test Samples
Lorraine ORLUX Carbons
CARBONS INC., BOONTON, N. J.
• STEADIER LIGHT
• LESS ATTENTION
• PERFECT COLOR BALANCE
Free Carbon Chart

Laughs from Reel Life

During the heyday and payday of vaudeville, somewhere along in the 'teens, Jaek Lewis, a member of IATSE Local 219 as employed as projectionist at the Palaee theatre in Minneapolis, which was at the time one of the city's largest and finest theatres. A very eompetent workman — Jack was also known for his dry and sharp sense of humor — indeed a sometimes sly sense of humor. During one of the vaudeville "seasons" the theatre manager developed a critieal attitude relative to the laek of light intensity projected to the performers from Jaek's old vertical are spot lamps.

Prodded by the manager, Jack adjusted his rheostats to deliver every ampere at the arc they were built to deliver. The manager, however, was still unsatisfied Jack had done everything he was able and his words to Jack were brief and easily understood — "Now, Jack, I want ya' to fix that spot lamp so ya got more light out of it — I don't eare what ya do, but do it — even if ya only get one more candlepower. But we gotta have it." Not long thereafter Jaek got a eall on the "house" phone. "Did ya do anything to that spotlamp to get more light of it?"

"Yep," quoth the blithsome Jack, "eome on up to the booth an' I'll show ya."

The manager took the long, long walk from his basement offiee to Jack's "booth" 'way up in the very top of the balcony. Puffing like a donkey engine the manager fell onto the nearest ehair. "Well what did ya do to fix things up, Jaek?"

"Look," said Jaek, as he swung the lamphouse door open. "You wanted the last 'candlepower' we were able to get out of that lamp, and there it is." And there inside the big spotlamp was a lighted plumber's candle burning brightly and it was neatly taped to the vertical negative carbon! The manager laughed when he saw the "extra" one eandlepower.

"Well, Jack, that settles it, I guess we'll use this lamp just as it is — it's a cinch you sure did your best!"

He then left the booth for the long walk back to his offiee, and never again did he give Jack any further orders to "get more light out of that spot lamp!"

• • •

In the very early days of "sound pictures" — perhaps along in the very early "thirties" a certain midwestern "independent" manufacturer of a sound outfit — and a good one — used film salesmen to introduee and sell his outfit out in the small towns and the hinterlands — of the great midwest.

One of these ambidextrous salesmen was a glib and facile "kerriekter" we'll call Miekey Coh, — but that, of course, was not his real name, — who was reputed to be able to sell hot air at a cyclone. Mickey called on a theatre owner in the deep wilds of farthest North Dakota for the purpose of selling him one of these symphonic marvels of sound reproduction and proceeded to let go at the man with a lengthly and powerful verbal blast about his meehanical and electronic wonder. The exhibitor sat quietly and listened in rapt attention, — apparently eonvinced by Mickey's waterfall of words. Finally as the super salesman came up for breath, — the exhibitor had a question, — only one question. "Now Mickey what about the acoustics for this outfit, — are they much of a problem?" Removing his eigar from his mouth, Miekey let the poor guy have it — and stared him squarely in the eye, — "Look man ya' got nothing to worry about on that seore. Ya see the acoustics come right with the outfit!"

Relieved and satisfied the exhibitor heaved a sigh and said "OK boy, I'll take it, — write up a contract and I'll sign it and give ya' a check for it, — and oh yes, — don't forget to write down about them "acoustics"!

iP

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CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES
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SHARP
CONTRAST
IN PROJECTION

Kollmorgen lenses rate tops in the motion picture industry. Used exclusively with Cinerama, they are standard equipment in more than 70% of American theaters. Wire sharp eontrast of the projeeted image on the sereen—the whole screen—is typical of the outstanding performanee of SUPER SNAPLITE® lenses.

Other advantages that add up to superior screening with SUPER SNAPLITES are:

- Fastest lens speeds
- Uniform illumination
- Crystal clarity
- Wide range of focal lengths
- Sealed construction

Bulletin 222 describes Kollmorgen lenses in detail. See your equipment dealer, or write us direct.

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INSPECTION . . .

. . . Continued from Page 9

mm print stock. This is a special film 35mm wide but with 16mm perforations down each side rather than 35mm perforations. Two 16mm paths are printed on this stock. The 35/32 inspection projectors are similar to the 35mm machines previously described, but with sprockets designed to accept the 16mm perforations. Three frames are exposed on the screen for each path so that six frames are inspected at one time — three each from the two prints — with both picture and sound track area on the screen. These machines operate at 80 feet per minute. Viewing both paths in this manner, an hour of 16mm film can be inspected in about 13 minutes. After inspection, the film is slit into two 16mm widths for use on standard 16mm projectors.

16mm reversal films which have very small print totals — five or less — may be printed reversal. These 16mm prints would then be inspected on standard 16mm projectors, to check picture and sound.

One important factor the inspector must know is the type of showing for which the print is intended — whether it is for either 16mm or 35mm inspection to be screened with an arc or an incandescent lamp projector, or to be projected for the television screen.

Most 35mm prints will be shown in theatres on large screens or in large auditoriums, and projected with carbon arc projection lamps. However, 16mm film is usually screened in smaller rooms and projected with incandescent light sources. To insure the truest rendition of color and hue, color films are balanced for the type of projection light most likely to be encountered.

When inspecting 35mm color film on 35mm inspection projectors equipped with incandescent lamps, special filters are used to bring the color temperature of the light more nearly in line with arc light. 16mm color film, on the other hand, will most likely be viewed with incandescent light and, for that reason, the 16mm projectors are not filtered. (However, an occasional 16mm print is made for arc projection, an occasional 35mm print for incandescent lamp projection.) Filters are used on 16mm projectors when screening black-and-white films intended for television use, because television tubes are characteristically blue. These special filters were worked out between General Film Laboratories Engineering and Corning Glass Works.

All film, whether processed for television or screen use, should be screened by projection. There are times, however, when a producer may desire to see his television picture as it will appear when it is televised. For this purpose, General Film Laboratories installed complete 16mm and 35mm closed circuit film chains. Viewing monitors are placed in screening rooms and a standard home receiver is also available so that "on the air" and "on the wire" programs may be compared.

The inspection of motion picture films by projection, with trained and highly skilled personnel operating well-designed and properly maintained projection inspection equipment is, we believe, our best method for keeping a constant check on our product — and thus assuring the customer that he will receive consistently good processing and printing. **iP**



EDWIN KAPPEL DIES

CHICAGO — Edwin Kappel, a member of Chicago Moving Picture Machine Operators' Union, local 110, IATSE, died here late in August. Interment was at St. Joseph Cemetery, River Grove, Ill.

iP

CLARENCE LLOYD, 75

SEATTLE — Clarence L. Lloyd, 75, died at his home here following a heart attack. Lloyd, a native of Canada, had been a projectionist at the Evergren theatre. He was a member of local 154, IATSE, and the Evergreen Senior Citizens' club.

iP

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TAPE RECORDERS . . .

. . . Continued from Page 14

tetrachloride or special tape cleaning fluids. (There is also a tape made for this purpose, which is merely run through the machine.) The idler wheel, which is rubber, should be cleaned with alcohol or plain water rather than with the more volatile and thorough cleaning compounds—if the idler wheel ever softens there is only one solution: Get a new idler wheel.

Even if close inspection shows considerable build-up on the recording heads, do not yield to temptation and use a razor blade or a thin tape cutting knife to clean the head itself. You'll scratch it sure as shooting.

The entire cleaning procedure should be followed after every 8 to 10 hours of running time.

If your machine is not one of the professional recorders and uses pressure pads to hold the tape snuggly against the recording head, these pads are a frequent source of difficulty. They are subject to wear, and the springs holding their tension may get out of alignment. The pressure on the pads should never be so much as to slow down tape movement or the head will be unduly abraded. Check the pressure pads frequently; if they are thin take them off and cement in a new one with Miracle cement or, if you don't like the black appearance of the Miracle cement, Pliobond. It is always a good practice to keep extra felt pads to fit your machine available, although your spouse's new felt hat can be trimmed up in an emergency.

Noise and squeal can be caused by guides out of adjustment, recording heads with excessive wear, too much tape tension or idler wheels which are in need of adjustment or lubrication.

A very important spot to watch is the head adjustment itself. The standard setting for the vertical gaps is at an exact 90° to the edge of the tape, but you will need a special azimuth tape and an output indicator to make the proper adjustments. It is a simple process, but if as is frequently the case the exact equipment is not available, the serviceman can usually do the job cheaper than it would cost for you to put in the output indicator or recording level indicators.

This azimuth alignment is considerably more important for a general purpose machine than would be the case for a recorder in your own home. In the latter case you are playing tapes made on that machine and any error in azimuth alignment will be cancelled out by this fact. But in the theatre or in the classroom the chances are you will be playing tapes made on other machines, and the alignment or absence of it becomes more serious.

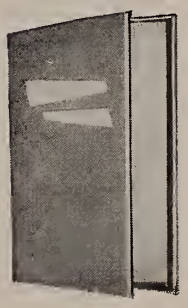
The speed of the tape machine can also throw off pre-recorded tapes substantially; here again one needs a strobotape or a strobelight which can be used to check speed with a measured length of tape. There are test tapes available which have a precise run and can be used in combination with a wristwatch with sweep second hand to check speed variations.

Again changes in the speed are more likely to be due to improper maintenance than to defects in the machine—that is, the pressure pads, the guides, the capstan and idler wheel all contribute to speed variations, as does insufficient lubrication.

In the future articles in this series we will go into the innards of your recorder to be sure that every part of the theatre or classroom background sound system can do the job everyone wants it to do.

In the final analysis it is the operator who can "make or break" both the background music and the recorder itself. Preventive maintenance is the quick and easy solution to most of your problems before they ever crop up. **iP**

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Data Communications Consultant, Bell Telephone Laboratories, Inc.

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In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

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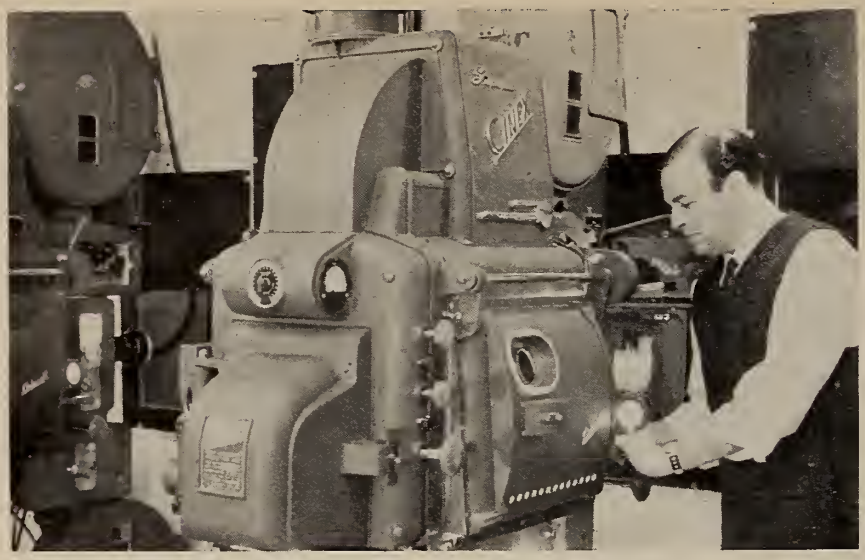
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TOWN THEATRE BOOTH — Andrew Margolin, president of IA local 640 and projectionist at the new Sinetar-Frank Town theatre, Glen Cove, N. Y., proudly displays the Ashcraft Super Cinex projection lamp on a pair of Century 35/70mm sound projectors. The Town theatre has been described by exhibitors, projectionists and other members of the film industry as one of the finest in the country. Equipment was installed by Capitol Motion Picture Supply Co. of New York.



GRAUMAN INSTALLATION— Frank Erler, of local 150 IATSE, with the new Strong 35/70 special Projection arc lamps recently installed for 70mm projection at Grauman's famous Chinese Theatre, Hollywood, Calif.

iP

CHECK HEALTH HAZARD

JOHANNESBURG, S. A. — According to a report by G. Burrell, general secretary of the South African Cinematograph Projectionists union, that organization is studying whether lung cancer is a more common disease among South African projectionists than in many other occupations there.

Secretary Burrell says members of the union, whose headquarters is in Johannesburg, have queried their organization regarding certain deaths which have occurred within the membership caused by cancer. The members feel that there is a posibility that these deaths can be attributed to the fact that they worked in projection booths.

iP

WATER-COOLED . . .

. . . Continued from Page 5

are essential for obtaining sufficient brightness but would otherwise create disturbing heat effects.

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iP

LAND OF PLENTY . . .

. . . Continued from Page 3

and theatre equipment threw their time and money behind all-industry service associations, such as the SMPTE, which started as the Society of Motion Picture Enginers and which organization has made and is still making important contributions to the technology of this art-industry.

iP



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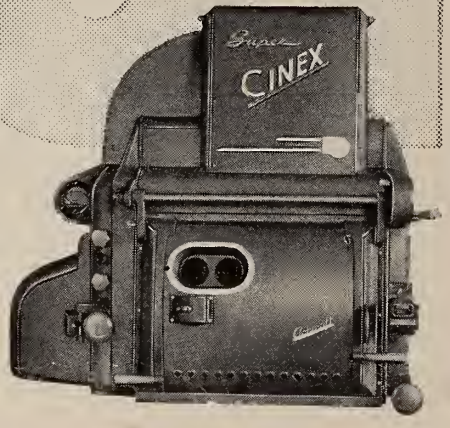
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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

TWO PARTNERS IN THE ENTERPRISE

In any labor, whether professional, sales, service, or craft, there are only two basic policies:

"Good enough is best" or

"Only the best is good enough."

The businessman — in this case the exhibitor — makes his choice or lets the customer make his choice for him. It is regrettable that we have not been able to make each and every exhibitor aware of the personal pride projectionists take in their work and their equipment, and the great effort they expend night after night to put on a good show for the customers. Exhibitors need to be shown by every means at our command that the projectionist recognizes the necessity of doing the best job for the theatregoer, that exhibitor and projectionist are the two partners in the enterprise, that one cannot succeed without the other.

The days are long gone when the projectionist shrugged, said "that's not my affair" when attendance declined, and stood idly by while equipment declined because of Profit's Law: When there is no new equipment; equipment becomes worse because there are no customers and there are no customers because equipment gets worse.

We realize the stake we have in theatres; the operator's locals see visual proof at every reunion. When the business turns upward, as it is now trying to do, there is a better feeling on both sides, and they become in truth partners in progress.

If more theatre owners would talk to projectionists who have jobs in theatres where the equipment is up to present standards, maybe the enthusiasm for good equipment would be communicated from the projectionist to the exhibitor — which would be good not only for the craftsman who operates the necessary machinery to put on a show, but the theatre's boxoffice as well.

Maybe, in that case, the exhibitor who lets his equipment run down, would be more conscious of the fact that he is cheating his customers when he countenances substandard projection and sound presentation of the quality films from Hollywood and abroad and that he is contributing to the debasement of a skilled workman's pride in his craft.

The projectionist, like all who work in show business, has a tinge of showmanship in him. Therefore, he isn't satisfied with the "good enough is best" policy in doing his part in presenting a show on the screen. But when the tools he has to work with are faulty, it may seep into his consciousness that it's the best he can do; this realization is a corroding thing and may gradually chip away his pride of craftsmanship.

Along with the revived awareness that high-standard equipment for sight and sound pays dividends in growing lines at the boxoffice, exhibitor and projectionist alike know they are partners in the theatre enterprise. As the awareness grows, as more and more new theatres are constructed, there will continue to be a demand for the skilled projectionist, and his ability will play a major part in convincing the theatregoer that motion picture theatres house the best in visual entertainment.

INTERNATIONAL PROJECTIONIST

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25-30 Club Meeting Told More 70mm Prints Are on the Way

NEW YORK — The Twenty-Five-Thirty Club auspiciously initiated its 1961-'62 season in mid-September at the Claridge hotel ballroom with more than 100 members and guests attending the session whose feature was a demonstration and lecture on the Norelco Universal 70-35 mm projector.

With the Club's president, Joseph W. Engle, presiding, the usual reports were waived, on a motion by Dave Garden which was approved by the members so full time of the meeting could be devoted to the demonstration of the Norelco projector by Nils Tuxen and Fred Pfeiff of the North American Philips company.

Tuxen said that 125 theatres in the U.S. had installed the Norelco 70-35mm projector and anticipated rising installations of his company's machines in view that "more Hollywood productions will be released with 70mm prints in the future."

Fred Pfeiff, who made the demonstration with a Norelco projector on the front platform (equipped with an Ashcraft Super Cinex arc lamphouse), said he had just returned from a tour of Hollywood studios and gave affirmation to Tuxen's prediction that more producers are interested in having their films being released in 70mm versions.

"Several Hollywood film-makers told me they are convinced that 70mm prints would do more justice to their productions at theatre presentations, at least for their bigger pictures," he told his audience. He also reported that next spring several pictures will be released in 70mm prints for drive-ins.

Pfeiff pointed out that the North American Philips company's plant at Mount Vernon, N.Y., is turning out several units of the Norelco projector that are sold in this country, Canada and Latin America. He said these parts included the lower and upper base, the motor drive, lamphouse bracket, and motors. And, he added, that if more productions are released in 70mm prints, his company may bring over the machines to manufacture the entire projector in this country.

National Theatre Supply, which distributes the Norelco 70/35mm projector, took part in arranging the demonstration. Photographs of the meeting reproduced in this issue are by courtesy of NTS.

Following the demonstration, Morris J. Rotker, secretary, called on J. F. Rollman, chief projectionist at the New York Rivoli — the first commercial theatre in this country to be equipped with the Norelco 70-35mm projector — for his remarks on his experience with the projectors. Rollman said that

(Continued on Page 18)

Hurley Screens Sold To Three Theatres

CORONA, N.Y. — Hurley Screen Co. announced here this week that three of its recent sales span the country coast-to-coast with an intermediate stop mid-continent.

Capitol Motion Picture Supply of New York has sold a Hurley SuperOptica 27'6" x 57'6" to the new Cinema theatre, Edison, N. J. Abbott Theatre Equipment of Chicago will install a 27'6" x 57'6" SuperOptica in the New Golf Theatre at Niles, Ill. Reaching all the way across the continent, S. F. Burns Co. of Seattle has sold a 25' x 50' SuperOptica to the new Bellvue at Bellevue, Wash. **iP**

FRANK S. BARTKUS

CHICAGO—Frank S. Bartkus, a member of Chicago Moving Picture Machine Operators' local 110, IATSE, died Sept. 22. **iP**

IA Threatens Ban on Non-Union Product

NEW YORK — Major film companies which agree to distribute independent films made in the New York area with non-union workers face a crackdown by IATSE, the union has warned.

IATSE officials said that there has been a large increase in the number of low-budget pictures which have been filmed on city streets and city buildings by non-union cameramen and technicians. These men, the union claims, work at a fraction of the regular scale or on a deferred-pay basis pending completion of distribution deals.

International officials said that it will instruct IA exchange employees to refuse to handle films which do not carry the IATSE union label. **iP**

Walsh Will Receive Human Relations Award

NEW YORK — Richard F. Walsh, president of the stage employees union since 1941, will receive the Joint Defense Appeals' annual Human Relations Award at a luncheon in his honor on Tuesday, Oct. 31, at the Park Sheraton Hotel.



Walsh

This was announced by Harry Brandt, president of Brandt Theatres and JDA campaign chairman, himself a former recipient of the award, Walsh will be honored by JDA's motion picture and amusement division which Brandt founded about ten years ago.

Making the announcement, Brandt said that Walsh was selected for the tribute because of his sympathetic understanding of the problems of human relations in American's pluralistic society and his earnest efforts to promote intergroup harmony. **iP**



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Constant Care, Cleaning Needed to Keep Light Bright on Theatre Screen

If selection and proper installation of a good quality screen is essential in obtaining maximum results from projectors, lenses and lamps, both projectors, lenses and projectionist must remember that constant maintenance is necessary if the light is to remain at a high level.

Time is the greatest enemy of screen cleanliness and lustre, and all screens need periodic washing or resurfacing. The time period will vary from theatre to theatre depending upon several factors. Theatre location is most important. It is obvious that a house in an industrial area or in a business area of a northern city where oil or soft coal is used for winter heating will require a brush-up more often than a suburban house.

Smoking, although a necessary comfort to patrons, causes screens to become yellowish very quickly. Airborne grime and tar particles unavoidably settle upon the surfaces of screens, darkening and discoloring them. The use of screen paints containing white lead is another factor in the deterioration of screens. Lead-containing pigments are not used in modern screen paints, for they gradually turn brown when exposed to the volatile sulphur compounds unavoidable present in town air.

Screens should be replaced when they become extremely dirty, although modern plastic screens may be washed repeatedly and certain older screens may be repainted. It is truly astonishing how many theatre owners tolerate old tar-yellowed, dirt-streaked screens which reflect scarcely more than 50 percent of the light projected upon them.

Old-style matte screens were ordinarily made of canvas coated with a rough-textured white paint to eliminate sheen and thus insure perfect diffusion of the light. When modern titanium-white and magnesium-carbonate pigments are used for surfacing, this older type of screen gives excellent projection results. The rough painted surface readily captures dust, however, and provides a large surface-area for the condensation of tars and other volatile impurities in the air which constantly circulates through the sound perforations. These screens may be advantageously cleaned only when slightly soiled. Resurfacing is indicated when they become yellowish or visibly streaked.

CLEAN BACK OF SCREEN FIRST

The sound perforations of theatre screens necessitate the most cautious screencleaning methods. Dust, often of a sooty nature, lodges in the perforations and must be removed before the front surface is cleaned. Failure to heed this precaution may result in streaking.

When cleaning any perforated screen, new or old, first vacuum the back surface to draw out the dust which is present in the sound holes. The front light-reflecting surface may then be brushed, washed, or

(Continued on Page 16)

First Aid for Sabotage

Washing the plastic screen is mandatory whenever soft candy or fruit has been thrown upon it. Projectionist Jean Neimoyer of Eureka, Calif. tells of a screen soiled by chocolate candy which front-row delinquents had hurled at movie villains. The manager succeeded in removing the sticky mess and in restoring the screen to a state of clean brightness with warm water to which was added a small quantity of a liquid household cleanser.

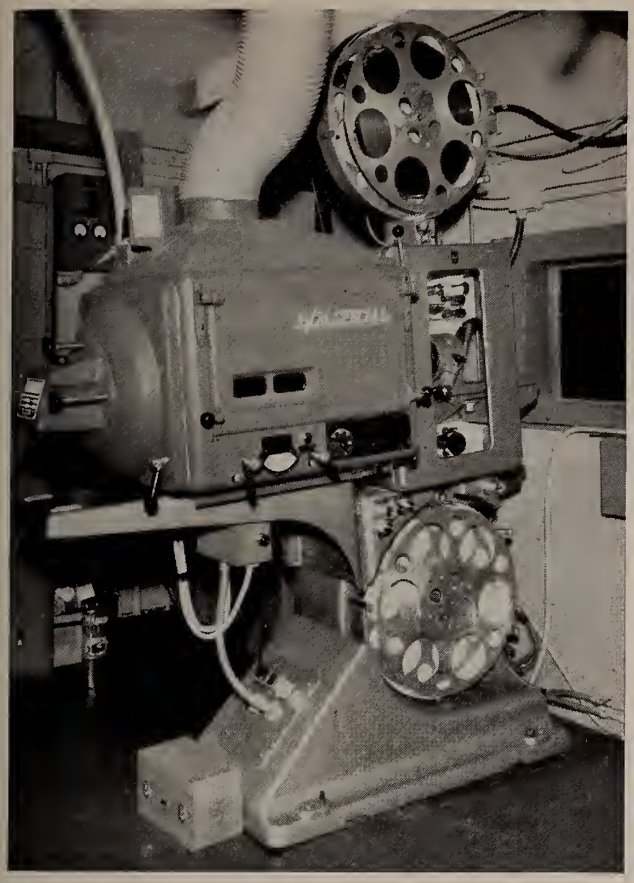
We recommend the following method:

1. Gently scrape off the foreign matter with a wooden spoon. Take care not to scrape down to the actual screen surface. Uplug sound perforations with a toothpick.

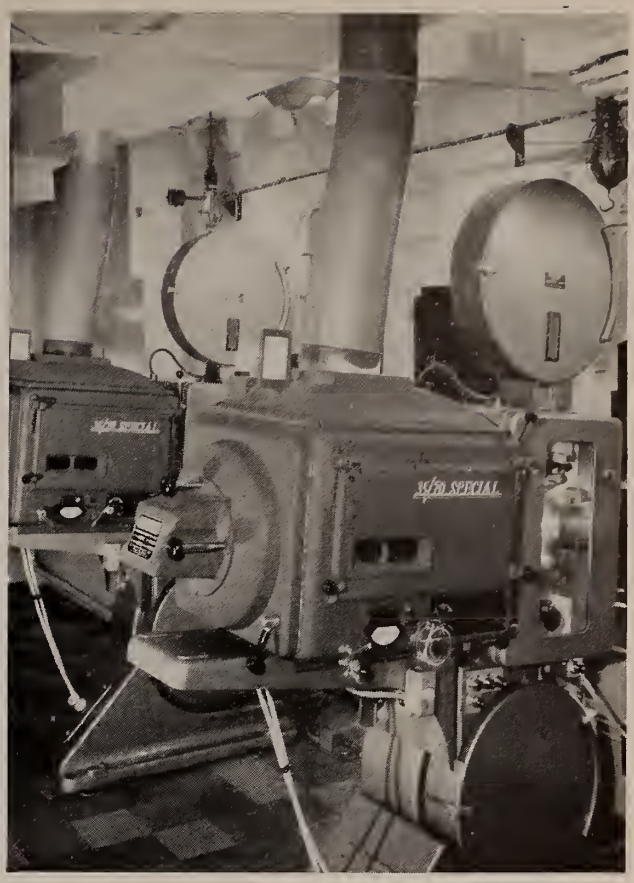
2. Sponge off the remaining cloth moistened with lukewarm matter with a swab of clean cotton soapy water. Keep the wetted areas on the screen as small as possible, and press a dry cotton cloth against the screen very lightly underneath the soiled area to prevent water from running down the screen.

3. Swab off the remaining stain with a clean cloth dampened with pure water.

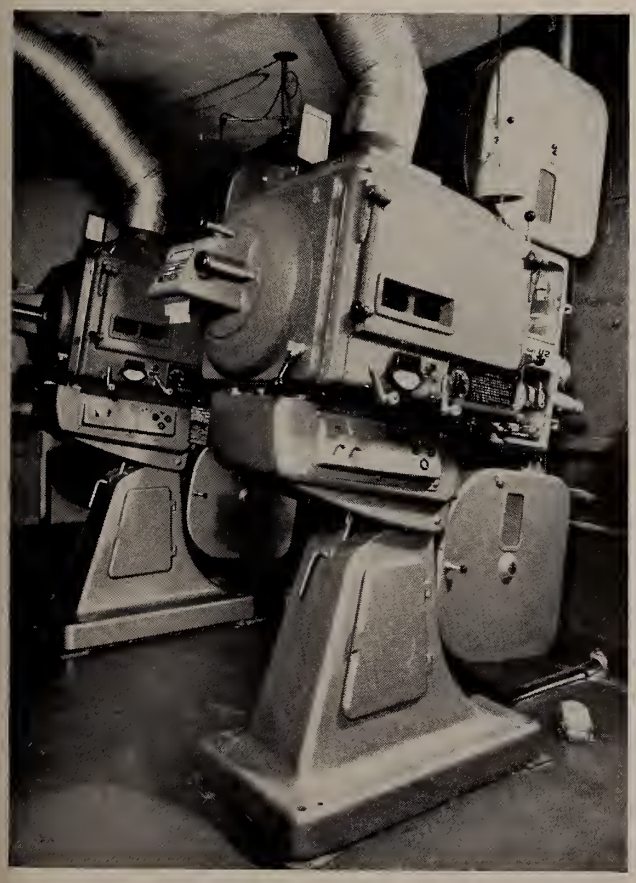
4. If it seems necessary, wash the entire screen by the previously given routine unless the screen is of the old surfaced-painted canvas type.



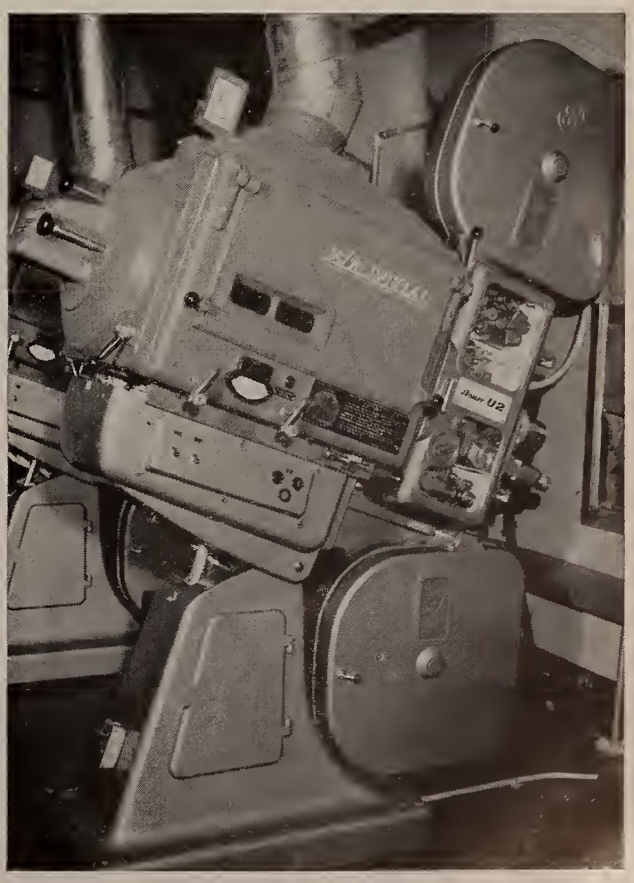
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During the golden anniversary dinner of Moving Picture Machine Operators Local 219, IATSE, local and national representatives of exhibitors, projectionists and IA management chatted: Above left are Benjamin Berger of Minneapolis, exhibitor; Frank Schilken, Jr., Robley Cramer of Minneapolis Labor Review, and Richard F. Walsh, International President of IA. At the right are Robert F. Smith, projectionist at the Uptown Theatre; Charles V. Thoren, Parkway Theatre; Erwin A. Peterson, legal representative for Local 219; John Baker, Sr., retired, and W. J. Yutzy of the executive board, all of Minneapolis.

Happy Birthday!

Three of 13 Founders on Hand for Minneapolis 50th Anniversary

MINNEAPOLIS — Gilbert Tollefson, Ray Dailey and Louis C. Junod — the latter two still working-boothmen — were singled out for special honors when Moving Picture Machine Operators local 219, IATSE, of Minneapolis celebrated its 50th anniversary at midnight Wednesday (Oct. 12) at the Normandy hotel.

The trio is all that survives of the group of 13 men who met in a room over a saloon next to the old Metropolitan Opera House back in 1911.

The Minneapolis local now has a total of 125 members and is headed by Sherman S. Parrish as president, Francis May, vice president; Donald Ellwood, secretary-treasurer, and Frank Schilckenm, business agent. Wallace Yutzy was chairman of the golden jubilee celebration which was held — as are all local 219 parties — at midnight to permit participation by all other members of the entertainment industry.

Dailey is still a spry 69 and his work as a projectionist started in 1908, three years before the birth of the local. He recalls that one of his first jobs — hand-cranked, of course — was unreeling a brief film depicting Dan Patch's record-breaking trotting race at the Minnesota State Fair grounds.

Dailey came to Minneapolis from rural Caledonia, Minn., in 1907 and got a job as a balcony boy in the old Unique theatre, a downtown vaudeville house which used short film shows as a crowd chaser. He was promoted to full-time operator a year later.

"Minneapolis was a great theater town those days," Dailey recalled. "There were six legitimate theaters — the Metropolitan, Dewey, Gaiety, Princess, Schubert and the old Lyceum.

"Then there were the Unique and the Bijou, top vaudeville houses. And movie theaters—why, I think there were more then than now."

Most of the movie houses were converted stores — long, narrow auditoriums with a makeshift projection booth at the back. The fancier houses had a "10-20-30" price policy — 30 cents for box seats, 20 cents for orchestra and front balcony, and a dime for what was left.

The movie houses in those days ran three one-reel features — usually a drama, a western and a comedy. The film was flammable and often burst into flames — "and you just got out of the booth in a hurry," Dailey explained.

Wages then were $9 a week—and the operator cranked his machine almost steadily from 1:30 to 11 p.m., seven days a week. The union today has made the craft one of the highest-paid in the city — even if there are fewer jobs around.

The union's battles today against

(Continued on Page 15)



The beautiful roses which graced the podium at the Normandy Hotel during the midnight-on banquet of Local 219 were the gift of Chet Herringer, Minneapolis theatre owner, seen on the left above talking about the capacity 50th anniversary crowd with Sherman Parrish, Lyric Theatre, Minneapolis, president of the local.

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UNION CARBIDE

G. B-Kalee Automated Projection Installed in Six London Theatres

LONDON ENGLAND — Six theatres in and around this city have converted to automated projection, with one projectionist sitting with the audience in the auditorium controlling picture focus, framing and sound volume.

The six theatres, of the C.M.A. circuit, installed the Projectomatic devices made by G. B-Kalee, a division of Rank Precision Industries. The Projectomatic system can be used without replacing existing projectors.

One-Man Operation

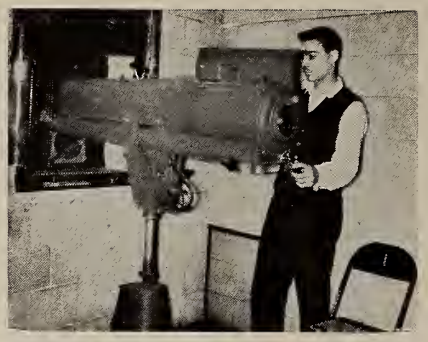
The accessory units in the system adapt the booth installation to a one-man operator who watches the screen presentation as a member of the audience with a control panel before him with switches, stud type volume control and buttons for emergency control of lighting and and curtain control.

Xenon lamps are installed in the six theatres, so the operator can switch the projector lamp on and start the show without giving any of his attention to projection lighting.

The C.M.A. installations are said to be the first step in a plan for automated projection on a large scale conversion of the circuit's multiple theatre units. The C.M.A. engineers cooperated with technicians of G.B.-Kalee in designing the equipment and its installation at the six theatres.

One theatre, the Angel in Islington, has an auditorium panel which in addition to carrying control for the adjustment of picture focus, framing and sound volume, has switches and pilot lights duplicating those in the projection room, thus enabling the operator to override the automatic program sequence.

(Ed. Note: The first question occuring to the projectionist will probably be: what happens when the film breaks? In future discussions on this new system IP will explore why a control position outside the projection room is useful, why the system's design permits such a location — and what happens when the film breaks.)



FOR "LIVE" SHOWS — Bright illumination of live attractions playing the Lyric Theatre, Lexington, Ky., is now assured by the installation of a Strong carbon arc follow spotlight. Shown operating the equipment is Joe Crawford.

The remote focus and framing equipment consist of two focusing and two framing attachments — one for each of the two projectors, and a wall mounting case containing the control gear for both of these functions.

The control circuits are arranged so that only the projector which is working is affected by operation of the remote control keys. Direct manual adjustment of focus is retained and is independent of the remote system. In the case of framing, the facilities for normal manual operation are not retained. Provision is made for emergency manual adjustment, but local control will normally be affected electrically by means of a key switch mounted on each projector.

The C.M.A. theatres in which the Projectomatic is installed are: Pavilion, Hackney; Oden, Kensal Rise; Gaumont, Walham Green;



This Gaumont Kalee 21 projector at the Angel, Islington, which employs Xenon lamps, large capacity spool boxes and Projectomatic, has been adapted for remote control of focus and framing by the addition of the two units shown attached to the front of the mechanism.

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Gaumont, Kings Cross; Odeon, Woking (which five rely entirely upon Projectomatic for general program sequence) and the Angel theatre, which has added switches as said above, whereby the operator can change the pre-arranged program sequence.



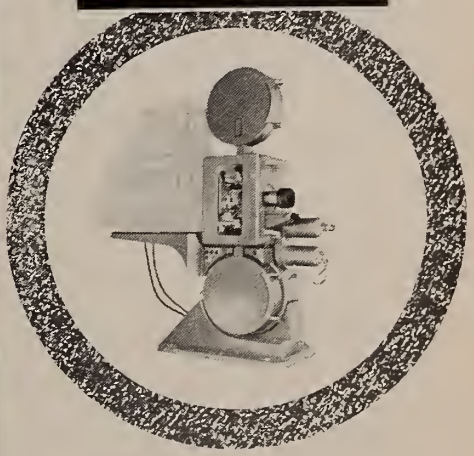


Sound volume adjustment (top photo) is being controlled from the auditorium with this G.B-Kalee remote control panel by the operator at the Odeon, Kensal Rise. The panel also has switches for adjustment of focus and framing and buttons for emergency control of lighting and curtains. In this type of installation employing Xenon lamps and large capacity spool boxes all the other operating functions are controlled automatically through Projectomatic. (Bottom Photo) The operator adjusts the focus and sound volume from the auditorium of the Angel, Islington. This particular G.B-Kalee installation which embodies Projectomatic, Xenon lamps and large capacity spool boxes provides alternative remote control of all normal functions.

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Preventive Maintenance Pays Off For Background, Lobby Sound Units

In the last issue, we discussed the normal preventive maintenance for tape recorders, pointing out that the use of recorded music, on tape and records, is becoming more prevalant in theatres as lobby background music and for the "coffee break" in art theatres.

We discussed briefly azimuth alignment, which may not be important if the machine has a combination record - reproducer head (which most of the cheaper instruments have) of if you never play any tapes other than those made on that same machine. Of course the azimuth alignment may "slip" as well as any other adjustment, and often you will find that earlier tapes made on the same recorder will have lost some of their fidelity — azimuth alignment is one check point to consider.

Particularly in the type of tape recorder use which the audio visual or theatre projectionist will be called upon to provide, the tapes were not made on the machine, the machine itself may be only a playback unit and not a record-playback unit so that azimuth alignment is worth consideration as a possible cause of difficulty.

In adjusting and setting the head gap alignment, only a small fraction of a degree in the single screw adjustment on the head can seriously affect the response.

To make the adjustment a special azimuth tape and an output indicator are needed. The alignment tapes are a series of test tones recorded with a head which is known to have the gap at a 90 degree angle to the tape edge. The output indicator can be any normal recording level indicator if it can be conveniently connected to the reproducing curcuit of the system. Output indicators sometimes available in the projection room can be used conveniently, although the audio-visual projectionist will likely not have this equipment.

The azimuth tape is played on the machine and the head is adjusted for maximum output at the higher frequencies. It is convenient then to "lock" the adjusting screw in position by a drop of Duco cement. That is all there is to the job unless you have a 3-head machine; in this case you must align the record head as well. For this we need some blank tape and a high frequency tape played on a second machine or playback head.) One records this tape on the machine to be aligned and the output is observed as it is played back through the previously aligned reproducing head. Then the record is adjusted as previously.

Another building up of noise into tapes is magnetization of the heads. Some tape recorders have automatic head demagnetization, but they are somewhat rare.

Obviously the passage of the tape past the playback head introduces magnetism in the head, either from the deposit of magnetic particles from the tape itself or from mere friction. When this magnetization accumulates it induces noise into the tapes and the playback.

To get rid of it you need a demagnetizor, which is held close to the head inducing a strong magnetic field into the head itself. You leave the power on the demagnetizor until you slowly pull it away from the playback head. Finally, when you are a good distance away from the head, the power is disconnected either by switching or pulling a plug in the smaller type of demagnetizors.

It does no good to jerk or move quickly away from the head since what we are trying to do is diminish the magnetic field around the head. When it is done properly the magnetic field in the head is reduced to zero with no residual magnetism. If it is done wrong there is as much or more magnetism in the head as there was when the process was started, so it is a good idea to read carefully the instructions packed with the head demagnetizor.

About the last source of difficulty in playback of tapes on the "top" of the recorder is in minimizing hum. Everything else, other than what has been discussed here, will be in the electronic portion of the equipment, which can be discussed separately since it differs in very few respects from the electronic maintenance involved in the booth and in normal radio equipment.

Hum in a tape recorder is found in the power transformer or in the motor (or motors).

Some of that noise you hear in the less elaborate tape recorders is not hum, it is noise of fans and belts, which unfortunately cannot be helped in most instances, although frequent drops of oil on the fan bearings and being sure the fan blades are clean will help to keep this interference to a minimum.

The oiling and dusting of the fan blades is a normal part of preventive maintenance, although in some recorders it is very difficult to get at the fan blades and inside of the machine—if you have one of the average types of recorders in which a dozen or more screws must be removed from the top deck of the machine before access is gained to the innards, there is nothing you can do but swear and live with it.

The power transformer has already been located in the best possible position for the induction of actual hum but if there has been some mistreatment of the recorder or carelessness in manufacture the

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loosening of the transformer and trying a few different positions or angles of tilt to see if any of them reduce the hum might be a solution. If that turns out to be the case you will have to shim or build up the high side of the transformer in its new position so that it will stay there.

The motors should be phased for minimum hum: Unplug them, turn on the amplifier and set the volume control at somewhere in the midpoint of the recorder's range. Then plug in the motor, observe the hum level, unplug it, give the plug a half twist and plug it in again. Whichever direction gives the minimum hum should be used permanently. If there is more than one motor, as is frequently the case, the same procedure should be followed with each. If in the rare circumstance that the polarization of the plug is opposite for each of two motors, the entire job will have to be undertaken in the service shop. (Also if this happens the manufacturer of the equipment should be treated to a few choice words).

Later on some of the common tape recorder troubles in the inside of the machine can be discussed, but usually the type of preventive maintenance performed by the projectionist or audio visual specialist in the proper follow-through of his job will keep the recorders operating smoothly and the sound on playback respectable.

As a general rule all of your playback equipment will do as good a job for you as will your projection equipment — if you give it the same care. **iP**

JOSEPH GREENBERG

CHICAGO — Funeral services were held Saturday, Oct. 7, for Joseph Greenberg, a member of Chicago Moving Picture Machine Operators' local 110, IATSE, of Chicago. **iP**

Ferris Wheel Principle Employed by "Cinebox"

NEW YORK — The "Cinebox," made in Italy and being distributed in the U.S. by Don Twomey Associates of New York, shows sound films as a sort of juke box for bowling lanes, super markets, travel agencies, etc., operating on a ferris wheel principle.

The wheel wound with 16mm film offers 40 individual short subjects of five minutes each. The Cinebox is placed on a lease basis. **iP**



DETROIT INSTALLATION — The most powerful follow spotlights available were necessary for the brilliant illumination of attractions at Detroit's mammoth new Convention Hall Arena, Cobo Hall. Shown is Stanley Skara operating one of the gigantic light sources manufactured by Strong Electric Corp. of Toledo.



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Split Frame Techniques, Screen Quality Discussed

NEW YORK — Split frame techniques and screen quality and process control were discussed in a session of laboratory practices during the 90th Convention of the Society of Motion Picture and Television Engineers at the Lake Placid Club in Essex County, New York.



Daan Zwick and Charles Osborne of Eastman Kodak Company led off the session with a paper on the "Use of Split Frame Techniques in Motion Picture Investigations."

The split frame technique consists of exposing the two halves of a negative or print in separate exposure operations. By means of this technique, many of the unwanted variables of photographic tests can be eliminated. In tests of lighting, make-up, filters or cameras, for example, exposing the negative split frame permits common negative process, printing and projection operations. Split frame printer tests permit common print stock, print process and projection, thus minimizing these variables. The final convenience is the side-by-side comparison without special projection equipment.

Examples from a negative filter test, various printer variations and a graininess investigation will be demonstrated by the authors.

"Screen Quality and its Relationship to Process Control," was the subject of a paper by Robert O. Gale, color technology division, and Allan L. Williams, film testing division, Eastman Kodak Company.

Screen quality is directly related to the control exercised in the processing of the negative, intermediate and print films.

Some of the more common chemical and mechanical processing conditions that must be maintained under control to avoid inferior screen quality in the system using Eastmancolor Films will be described. To demonstrate the effects of some of these variables, a side-by-side picture comparison will be presented, using the split screen technique described in the previous paper.

F. P. Alles of E. I. Du Pont de Nemours & Co., Inc., discussed "Ultrasonic Splicing of Polyethylene Terephthalate Films."

A systematic study covering six variables shown by preliminary tests to be most important in splicing "Cronar" polyester base by the application of ultrasonic energy showed complex interactions. However, a good operating range was found which yielded useful splices, without scraping of the emulsion, with as little as 0.010 in. overlap and splices as strong as the base itself at an overlap of 0.030 in. The splicer designed and used in these studies could handle 8, 16, 35 or 70mm films and hence permitted tests covering a wide range of conditions of use.

Mario Calzini and Massimo Caturelli of Technostampa of Rome, Italy, collaborated on the following paper entitled, "Transistorized Control System for Printer Light Change."

The position of the light-changing notch on negatives may not be standard, which may result in a problem of a negative is printed in more than one laboratory. To overcome this problem, a device has been designed that detects the notch and produces a delay adjustable to 1/36 of a frame by means of a transistorized binary counter without relays. The solenoid operating the light changer is actuated

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by a power transistor. The unit is in a small housing containing several plug-in modules on printed circuit cards for easy replacement and interchangeability.

"A New Concept in Automatic Additive Color Printing," was discussed by Hans Christoph Wohlrab of Bell & Howell Company.

Among the many improvements of a redesigned automatic additive color printer are a faster acting memory device with a new type of light valve incorporating 74 steps of 0.025 log E, a six speed tape controlled fader, a zero light cut-off, automatic torque control of tight winds, a new lamp source, and plug-in type relays. Safety of operation and ease of servicing were prime design specifications.

iP

50th YEAR

. . . Continued from Page 8

decline are reminiscent of its problems on the way up. It made Minneapolis labor history in 1920 in the Wonderland theater case, when the city's top labor leaders went to jail in defiance of a court injunction against picketing.

"Movies may be b e t t e r than ever," he grudgingly admitted, "but we had some great ones in the old days.

"Any of the D. W. Griffith pictures were classics. And then there was Tom Mix in the westerns, even before William S. Hart. And for comedy, there were Lyons and Moran — why, they were terrific."

Richard F. Walsh, International president, came from his New York City headquarters particularly to be with Local 219 at its celebration. Joining him at the head table were Edward P. Schwartz, Ad Art Advertising Company and assistant chief barker Variety Club of the Northwest, Minneapolis, who acted as toastmaster, representatives of the Minnesota state IA organization, the Central Labor Union, Local 13 Minneapolis, Local 356, St. Paul, Local 219 officers and many others.

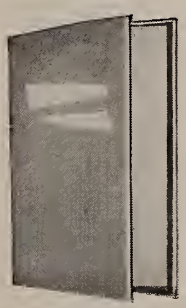
Officers of Local 219 for the golden anniversary year are Sherman Parrish, president; Francis May, vice president; Frank Schilken, Jr., business representative; Donald Ellwood, financial secretary; Rodolph Peterson, recording secretary, and J. Steingard as sergeant-at-arms. On the executive board are Pat E. McMurchie, W. J. Yutzy, Mr. Parrish, Mr. Schilken and Joe Lewis.

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By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

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1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
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9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
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SCREEN CARE

. . . Continued from Page 6

repainted without danger of smearing the screen.

Use the extension or brush attachment when vacuuming a screen, and vacuum only the rear of the screen, NEVER the front surface! A vacuum cleaner in good working order will insure against putting dust upon the light-reflecting face of the screen.

It will be necessary, in most theatres, to move the speaker units back out of the way before vacuuming the rear of the screen. But before doing this, mark the positions of the speaker cabinets and baffles upon the stage floor in yellow crayon or blue marking chalk. The speaker units may then be returned to their former positions after the screen has been cleaned. Guard against damaging or wrongly connecting the speaker cables.

After the back of the screen has been vacuumed, brush the front surface in downward strokes with a wide soft brush which is known to be scrupulously clean. Never apply to a screen a brush which has been used for other purposes. Never use a brush having stiff bristles, as these may imbed gritty particles in the screen surface.

Begin at the top of the screen, brushing downward, and work your way across its entire width. Then go all the way across the bottom half with the same vertical strokes. When you have finished, clean the brush and wrap it in a clean cloth to protect it. Screen brushes are best kept under lock and key, preferably in the projection room.

Many old-style screen surfaces cannot be washed without removing some of the screen paint and streaking the screen. We reserve the washing operation only for new-style plastic screens having the light-reflecting pigment suspended in the plastic surfacing.

The original reflecting powers of old-style matte and aluminum screens can be restored only be resurfacing with high-quality screen paints. In fact, screen reflectance, after resurfacing, may even slightly exceed that which the screen had when it was new. This may be attributed to two factors, namely, the superiority of present-day screen paints and reduction in the size of the sound perforations with each repainting. The latter factor is not appreciable so far as apparent brightness of the picture is concerned, but it may have pronounced effect upon the quality of the sound reproduction.

It may be thought that partial plugging of the screen perforations would cause nothing more than an inconsequential loss of sound volume. True, the total attenuation of sound energy by holes of reduced size is very slight, but this attenuation unfortunately occurs in the higher frequencies. The result, when the effect of plugged holes is pronounced, is "muffled" sound. Although this trouble may be remedied by overamplifying the high frequencies relative to the low frequencies, the installation of a new screen of better transmission characteristics is preferable.

The sound perforations occupy from 8 percent to 10 percent of the total area of the screen surface. This means that a perforated screen has from 92 percent to 90 percent the brightness of a solid (non-perforated) screen of the same type and condition.

No noticeable effect on sound reproduction is produced, however, until the holes of a canvas screen have been reduced to about a quarter of their original size by the repeated application of screen paint. (Thin plastic screens can stand an even greater reduction of perforation size before the sound is affected.)

But if the perforations occasioned a light loss of 9 percent when the screen was new, the resurfaced screen having holes paint-filled to the extent of 75 percent of the original perforation area will show a brightness gain of (9% x - 1/0.75) 9% = 2%, very nearly. This light increase is too small to be perceived; and the attendant risk to good sound quality is too great to be tolerated. Therefore avoid plugging the sound holes when resurfacing an old screen.

To repaint an old-style perforated screen, apply two thin coats of the best-quality screen paint by means of a spray-gun. Let the first coat dry thoroughly before applying the second. Do not use a brush to paint a perforated screen, as this will clog the sound holes. Be extra careful to apply a number of very thin coats when repainting aluminum screens, as unavoidable runs in thick coats are visible in the picture as spots and streaks.

For matte screens use lead-free flat white screen paints of the titanium-magnesium type having reflectances of from 0.90 to 0.95 when applied to a solid surface. For metallized screens employ medium-grain-bright aluminum paints made especially for screens. Theatres of moderate width may benefit if a thin coat of white screen paint is applied over two coats of the brightest aluminum paint. This will brighten the picture over the main viewing area.

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Published monthly at Main Postoffice, Minneapolis, Minnesota for October, 1961.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Frank W. Cooley, Jr., Minneapolis, Minn.

Editor, Frank W. Cooley, Jr., Minneapolis, Minn.

Managing editor, none.

Business manager, Ray Gallo, New York, N. Y.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1% or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) 6982.

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plastic material, with or without cloth backing; and only this type of screen, as we have said, may be safely and advantageously washed. These screens have the light-reflecting pigments suspended in the plastic layer where surface-washing cannot possibly remove or otherwise affect them. Such screens should not be painted. Their original brightness is restored by washing.

Before washing your plastic screen, vacuum the rear surface and brush the face according to the procedures previously given. The more dust you can remove before applying moisture, the more satisfactory the washing operation will be. But be very careful, when working on a thin plastic screen, not to dent it. This requires constant vigilance while using the vacuum cleaner on the back of the screen.

Use a large sponge dipped in a weak solution of pure soap in pure water, and squeezed out so that the sponge is damp, not dripping wet. A mild detergent may be used instead of soap, if desired; but the solution must be weak. Never apply such solvents as alcohol, acetone carbon tetrachloride, naphtha, gasoline, etc. to a plastic screen. Certain plastics are softened, frilled, blistered, or even dissolved by organic solvents.

Wash the front of the screen only, and with vertical strokes from the very top of the screen to the very bottom. Apply the wet sponge gently so as not to dent the screen or damage its surface. Don't wash too large an area at a time, for it is essential to wipe off the dirt-polluted wash-water with a clean, nearly dry sponge wrung out in clean water from time to time.

When one small vertical section has been washed and dry-sponged, advance horizontally to a new vertical section, repeating the operation until the entire surface has been washed and dried. Your screen will then perform like new, giving daylight-bright images having maximum clarity and contrast.

Because warmth softens and deforms certain plastic screen materials, we hesitate to advise the use of warm water. Stay on the safe side, therefore, by washing screens in water no warmer than the prevailing room temperature. This means lukewarm, not cold, water.

The use of commercial liquid cleansers is also fraught with danger. Many such household cleansers are comparatively harmless aqueous solutions of mild detergents, but others are either organic solvents or solutions of corrosive alkalies. Stick to Ivory soap or Lux soap-flakes, and your screen will be safe from destruction by chemicals.

An ounce of prevention is worth a pound of cure, they say. To prevent a screen from becoming excessively dirty is good common sense, for soiled screens waste enormous amounts of light (which represent high carbon and current expenditures) and require frequent laborious cleanings or repaintings. Visible streaks and isolated spots of dirt are very annoying to patrons.

A perforated sound screen is unfortunately a natural dirt-catcher. Air circulates through the sound holes continually, carrying dirt particles which lodge in the holes and settle upon the light-reflecting surface. We can't stop the circulation of air, but we can take simple precautions to minimize the amount of dust passing through the sound perforations.

Keep the backstage area clean! Remove the clutter of old shipping crates, packing materials, cardboard and paper waste, unused vaudeville props, etc. upon which thick layers of grimy dust accumulate. Store stage furniture neatly at one end of the backstage area and carefully sweep the floor with a damp broom. Remove dust from the speakers and baffles, and, if sound drapes are used for killing back-wall echoes, give them a thorough cleaning.

Janitor work on so large a scale is not normally a part of a projectionist's duties; but because the responsibility for a clean and orderly backstage area is shared by the projectionist, he has every right to request the management to have this work done.

Be sure that the curtain is kept closed in front of the screen after the last show at night and in the morning when the janitors are cleaning the auditorium. The screen will thus be protected against some of the dust unavoidably raised by the daily auditorium sweep-down. And if the theatre has a grand drape (front curtain) in addition to the title curtain, close both while the janitors are at work. The cleaner your screen, the brighter, clearer, and more uniformly illuminated will be the picture. The picture projected upon the screen, be it remembered, is what our patrons pay to see.

iP







Officers and guests, including speakers, are shown above at the recent meeting of New York City's 25-30 Club; Left to right in the front row are Jack Winick, past president; Joe Krimmin, secretary-treasurer; Joe Engle, president, and Morris Rotker, recording secretary. Center: Morris Klapholz; Nat Daragoff, past president; William Anderson, past president; Harry Berghoffen, Nat Strauss, Julian Wetzler and Ben Norton, also a past president. In the back row are Niels Tuxen and Fred Pfeiff of North American Philips Norelco.

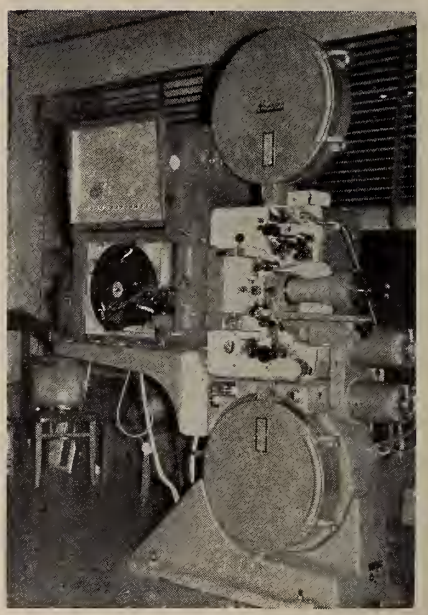
25-30 Club Sees Norelco-Ashcraft Demonstration

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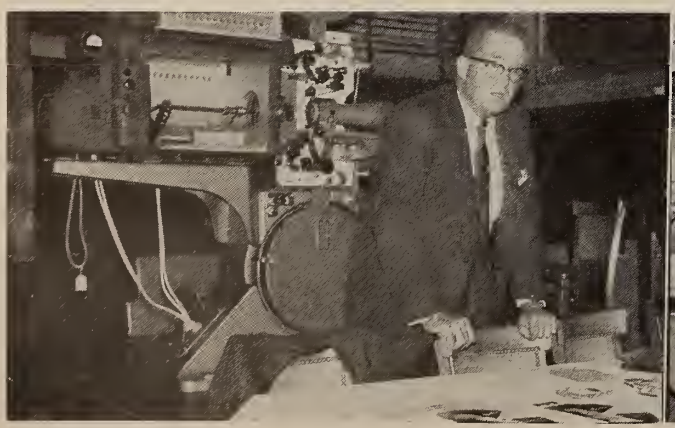
the Rivoli had just one print of Mike Todd's "Around the World in 80 Days" (in Todd-AO) which ran for 786 performances. "I leave it to fellow projectionists what that recommendation means," he added.

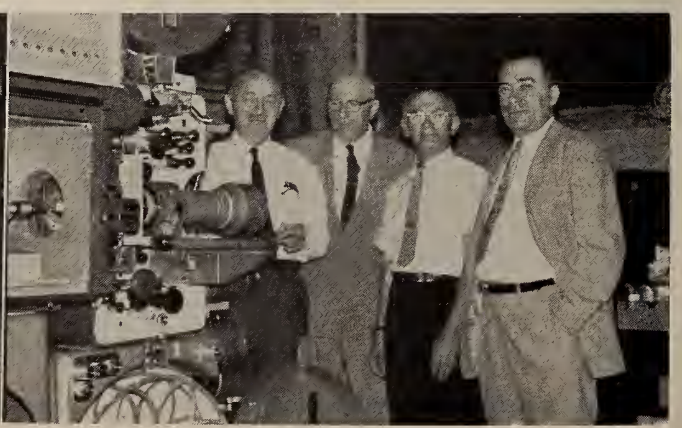
Rotker introduced several guests and members that were in attendance at the meeting, among them Mrs. Mary Ashcraft, of C. F. Ashcraft Manufacturing Company, and her son Buddy; Allen Smith of National Theatre Supply, and Judge Nathaniel Doragoff, whom New York Senators Javits and Keating recommended to Attorney General Robert Kennedy for consideration for appointment to one of the newly created judgeships on the United States District Court. The Senators took that action upon receiving a letter from Mr. Rotker and Morris I. Klapholz, of the Twenty-Five-Thirty Club suggesting Judge Doragoff for such an appointment.

iP



The equipment demonstrated, a Norelco projector with an Ashcraft lamp, is shown at the right. It's the Universal 70/35 mm, with a Super Cinex lamphouse.





At the left above, the Norelco projector is discussed by Norelco general manager Niels Tuxen during the meeting of the 25-30 Club. At the right, gathered around the equipment, are Fred Pfeiff, technical manager of Norelco; Joe Engle, Morris Rotker and Ben Olensky of Radio City Theatre.

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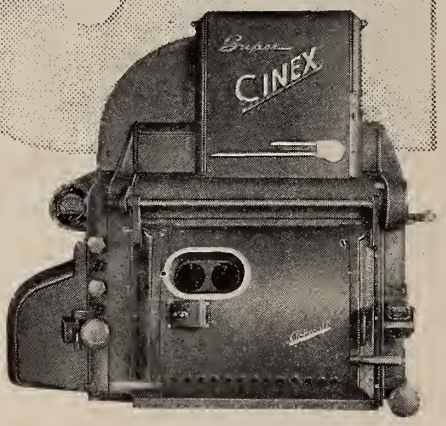
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INTERNATIONAL PROJECTIONIST, published monthly by the Internatianol Projectionist Publishing Ca. divisian af The Northern Publishing Ca., Post Office Bax 6174, Minneopolis 24, Minnesota. Editarial affices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscriptian Representatives: AUSTRALIA—McGills, 183 Elizobeth St., Melbaurne; NEW ZEALAND—Te Ara Book Depot, Ltd., 64 Caurtnay Place, Wellingtan; ENGLAND and ELSEWHERE—Wm. Dawsan & Sons, Ltd., Macklin St., Landon, W. C. 2. Subscriptian Rates: United States, Canada, and U.S. Possessians, $3.00 per year (12 issues) ond $5.00 for two years (24 issues). Foreign cauntries: $4.00 per yeor and $7.00 for two years. Changes of address should be submitted four weeks in odvonce of publicatian date ta insure receipt of current issue. Secand-class pastage poid at Minneapalis, Minn. INTERNATIONAL PROJECTIONIST assumes na respansibility for personal apinions appearing in signed articles, ar far unsolicited articles. Entire cantents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

SMPTE—Source for Vital Information

The Society of Motion Picture and Television Engineers continues to grow (a new Detroit section was recently formed), though it baffles some film men associated with the organization that so many in the motion picture industry have overlooked the contributions, past, present and future, which this non-profit group has made to the practices and standards of motion picture technology.

The society's semi-annual conventions constitute a national forum for the engineering and scientific phases of new motion picture developments and new processes in manufacturing raw stock, its processing, production and exhibition. Its monthly Journal is a source book for reference on the technical advancements of the motion picture. The society, in collaborating with other groups, has set up standards which guide production and exhibition. Its twelve regional units' meetings disseminate information about particular products and processes.

One member of the society says his impression is that filmmen—especially exhibitors and some projectionists—have gotten to look on the society as an "egghead group" whose talk and texts are 'way over the heads of practical theatremen and craftsmen." That may be true in some cases by the very nature of the engineering mind, which expresses itself in precise and careful terms.

But the society's work was most practically demonstrated in the last decade when so many new developments hit the film industry—Cinerama, CinemaScope, magnetic sound, Todd-AO, 35/70 mm projection equipment, etc. This engineering group did yeoman service in digging up essential facts for the exhibition end of the industry in cooperation with makers of equipment, studios and other such societies in giving techniques for handling the advanced developments and setting standards, presenting papers and demonstrations at its conventions, with the record published in the Journal of the SMPTE as well as International Projectionist.

The present president of the SMPTE is a filmman—John W. Servies of National Theatre Supply. The group was formed in 1916 as the Society of Motion Picture Engineers, which later took on work in the television field. All during its years of existence it has contributed much to the film industry with its forums for new devices and advancements of the growing pains of production, projection and screen presentations—it has been a prime source of practical utilization of advances in studio and theatre equipment.

Of course, the society's preoccupation with its engineering and scientific work has diverted the organization's public relations in the film industry, since it hasn't been notable for press relations with the film trade press. The film business is sort of 24-sheet-minded, and it takes a loud, and even brassy, voice to be heard around the industry. As a matter of fact, Mr. Servies referred to the lack of the society's press relations in the motion picture trade press at the last convention. The SMPTE now has 75 projects under way in the motion picture and TV field, with 12 technical committees. Every five years the society's committees get together with the American Standards Assn. to revise the standards already established. This takes many consultations and research.

While projectionists bulk large on the membership rolls of the SMPTE, it is suggested that other members of the craft should carefully read the society's texts and articles whenever they run across them, in their constant search for better projection hints and developments. iP

INTERNATIONAL PROJECTIONIST

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SIDEWEAVE:

Projection's Number-1 Problem

By ROBERT A. MITCHELL

THE ABSENCE of sideweave in 35-mm television presentations broadcast from network master studios is rightly disconcerting to theatre projectionists.

The range of annoying lateral movements of the image in average theatre projection is considerably greater than in most filmed TV programs shown directly from 35-mm prints. The projectionist can convince himself of this fact by examining the picture quality of such TV shows as Boris Karloff's Thriller, the Perry Mason Show, and a few of the too-numerous western and crime shows that clutter the airwaves.

The TV projector may owe its perfect rocksteadiness to a registration-pin claw intermittent which would ruin a brand-new release print in thirty or forty passes; but the absence of sideway is clearly the result of astute engineering which could be employed to advantage in the design of theatre projectors. Many of the theatre projectors in use are so old that they must be considered obsolete; but this should not prevent the incorporation of modern improvements into their ancient frames.

For several decades after the invention of motion pictures, projectionists were more concerned with vertical jumping of the image than with sideweave. The old-time movies danced madly on the screen, especially when shown with projectors having beater, pin-cross, or single-bearing geneva movements of crude construction. Only when the movies had attained stature as an entertainment medium did projectionists demand, and the public expect, rock-steady pictures.

Project intermittents began to be improved; and the improvements have continued to the present day. Rock-steady images on gigantic screens are now commonplace. But the same cannot be said of the lateral steadiness of theatre projection. The tremendous image magnifications required by CinemaScope and the panoramic screen generally have aggravated this defect.

The earliest projectors employed very crude and inefficient means of guiding the film laterally through the gate, but as we said, sideweave was not the big problem. The most noteworthy improvement in lateral guiding came with the Simplex flanged guide roller in 1910. The spring-loaded movable flange (toward the drive side of the projector) served to press the edge of the film firmly against the laterally-fixed flange (toward the operating side).

The Simplex guide roller was not affected by small random variations in the width of the film, and worked so well that it was, and still is, copied by many other projector manufacturers.

As a matter of fact, this feature of the Simplex projector established the outside edge of the film as the guided edge, and resulted in the placement of the optical soundtrack just inside the row of perforations nearest this edge. Only 16-mm soundfilm is guided on the opposite edge. (Magnetically striped 8-mm film is guided on the outside edge like 35-mm film.)

There are still so many thousands of Simplex Regular and Super Simplex mechanisms in use that detailed description of the Simplex flanged guide roller is unnecessary. Even if the mechanisms in your own theatre are later than the Super Simplex (1929), or of a different make, chances are that the guide rollers are similar.

Indeed, the Simplex-type guide roller was so very satisfactory that only the "fussiest" projectionists ever complained about its performance in the days before widescreen pictures. Slight sideweaving could sometimes be detected even when the picture was perfectly rocksteady vertically. Came 3-D stereo-scopic pictures in 1952, and CinemaScope in 1953, and the complaints became more frequent.

The polarized-light 3-D process required two homologous prints and two projectors synchronized to operate in unison, the "left-eye" and "right-eye" picture superposed on an aluminum - surfaced screen to preserve polarization. (The process doesn't work on matte, pearlized, or beaded screens.) Sidesway of the superposed images, even when slight, induced eyestrain—patrons complained

of headaches after viewing 3-D pictures. This was not the only trouble with 2-strip 3-D, but it was serious enough to contribute to the demise of a fascinatingly realistic process.

Popular clamor for the return of 3-D resulted in the recent production of a stereoscopic feature picture. Preview showings of this picture revived the old sideweave problem, which was so troublesome in certain New England theatres that the distributors finally decided to release the film only in regular non-stereoscopic form.

The CinemaScope widescreen process is also bedeviled by the sidesway normally produced by unmodified projectors made in the days of conventional "small-screen" projection. By magnifying the horizontal dimension of the picture twice as much as the vertical dimension, the anamorphic CinemaScope lens actually doubles the sidesway! An amount of sideweave not sufficiently great to be annoying in conventional projection suddenly became very objectionable with the advent of CinemaScope. In non-anamorphic widescreen projection, sideweave and vertical unsteadiness are, of course, magnified by the same amount. The image cannot be magnified by short-focus lenses without also magnifying all the defects of projection.

The Motiograph AA was the only pre-CinemaScope mechanism we know of in which the sideweave problem was completely licked. In addition to the regular flanged guide roller at the top of the film gate, a second such roller was placed between the aperture and the intermittent sprocket. There was no logical reason why the intermittent-sprocket shoe of all older projectors could not have been redesigned to function as an auxiliary film guide, but such a simple and obvious solution of the problem seems never to have occurred to the manufacturers.

Patent news from London indicates that a European manufacturer is contemplating a Chinese copy of the Motiograph AA double-guide system. And similar in principle, though not in construction, is the double guiding used in a popular make of 16-mm television projector, as shown in Fig. 2.

Instead of flanged rollers, however, stationary edge guides are employed in the TV projector. These are faced with osmiumiridium alloy or have insets of synthetic sapphire for long wear. The film is gently pressed against the fixed guides on the inner side of the gate by spring-loaded guides on the outer side. (The guided edge of the 16-mm film is toward the drive side of the projector, just the opposite of 35-mm practice.)

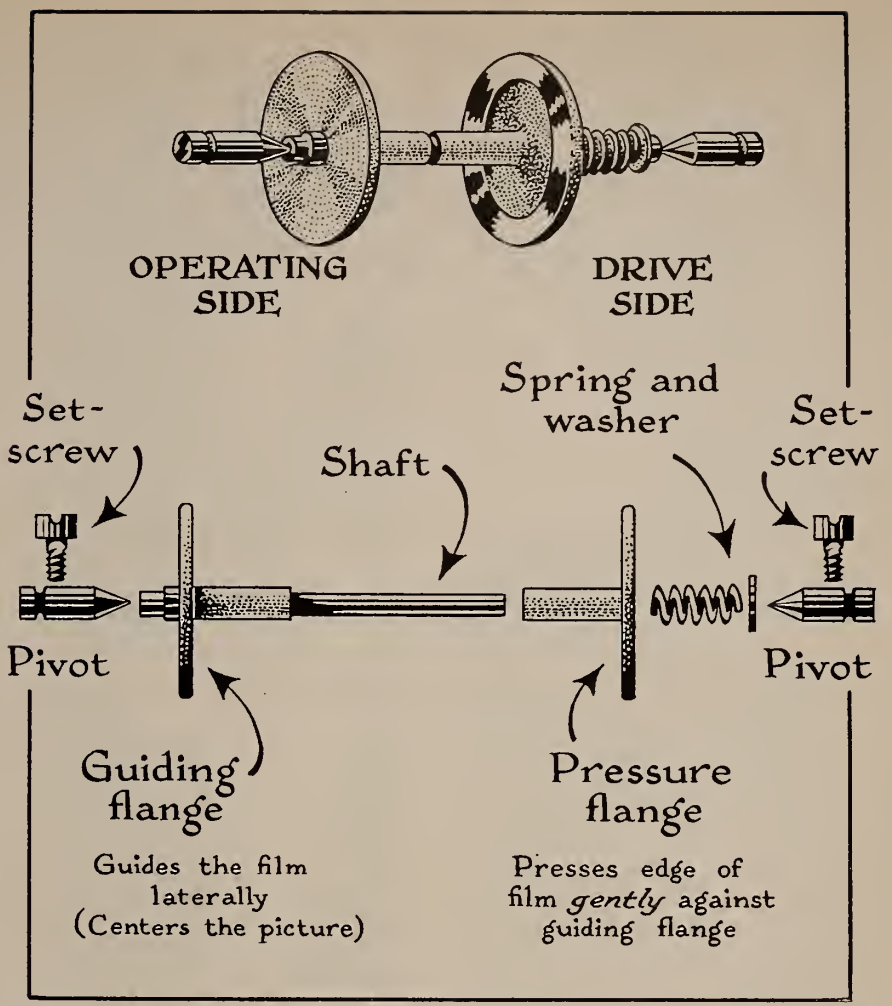


FIG. 1—A flanged guide roller of the type employed in most 35-mm theatre projectors. The lateral steadiness of the projected pictures depends upon the proper functioning of this component, located at the top of the film gate.

The two sets of guides succeed in keeping the film laterally motionless while it passes through the gate and by the aperture, thus insuring the projection of a weave-free picture on the plate of the vidicon tube in the pickup camera. The intermittent is a 7-to-1 claw movement which, although noisy and very rough on the film, gives rocksteady registration of the frames.

Although sidesway is no longer a problem for the fortunate users of the most modern theatre projectors, thousands of projectionists still have to make out as best they can with gimmicks dreamed up in earlier years to minimize sideweave. "Studio guides," for instance.

To be effective, edge-guiding rails must hug the edges of the film rather snugly. This is possible in cameras, sound recorders, and printers because dimensionally predictable raw stock is handled. It is manifestly impossible in theatre practice for the obvious reason that prints vary widely in width.

If the guide rails be set the right distance apart for slightly shrunken second-run prints, they will be too close together for new prints, and buckle the film. On the other hand, rails that are far enough apart for new prints allow seasoned prints to shift from side to side in a rapid, erratic manner.

This annoying effect, readily visible in thousands of theatres, is actually more noticeable than the wider range of slower, smoother weaving which obtains without the rails. In addition to this, studio guides get grooved by the film and require replacement when they do.

Modern American projectors having curved gates (primarily intended to reduce film buckle at high arc-radiation levels) are remarkably free from sidesway. All 70-mm projectors, American and foreign, employ curved gates. Users of the Simplex X-L can get rid of sidesway almost completely by installing the curved-gate assemblies available for this machine. The improvement in the appearance of the picture is gratifying when curved

gates are used: Better focus, less buckle, and no sideway.

Good as the original Simplex-type guide roller was in the days of conventional-screen projection, it does not quite measure up to the exacting requirements of 3-D, CinemaScope, or even non-anamorphic widescreen projected with cropped apertures and short-focus lenses. Where does it fail?

First of all, the film enters the flanges directly from the upper loop. The pulldown action of the intermittent sprocket causes the loop of film to lengthen and shorten 24 times a second; and even a small amount of this "loop flutter" between the flanges impairs the functioning of the guide roller (Fig. 3).

But this cannot be helped in the conventional theatre machine — the guide roller is at the top of the gate; and there is not room enough to place the upper loop any higher by changing the location of the upper feed sprocket.

In spite of the severe conditions imposed by the design of the older standard theatre projectors, much can be done by the projectionist to minimize sideweave and obtain widescreen pictures which both he and the patrons of his theatre will regard as very satisfactory. The two basic ingredients of the prescription: Inspection and correction.

The very first step is close inspection of the flanged guide rollers. Look for those defects, maladjustments, and signs of wear which make good projection impossible. Twirl the flanges with your fingers to find out whether or not they are bent. A bent "fixed flange" (the one toward the operating side) will cause the picture to weave in a slow periodic manner from one side of the screen to the other. Bent flanges usually get that way by being handled roughly or accidentally dropped when taken from the mechanism for servicing.

The second thing to look for is scoring of the film-contacting surfaces of the flanges. These are on the inside. Scoring will occure if the film fails to rotate the roller. In addition to causing sideway, scored flanges may roughen or shear off the edges of the film and rip weak splices apart. A brand-new guide-roller assembly is called for if the flanges be bent or scored.

Even if the flanges, themselves, are in perfect condition, the guide roller may function very poorly. It may be bone-dry and clogged with dirt, or the tiny end-pivots may be damaged or press in against the shaft too tightly, preventing rotation of the fixed flange. Then, too, the entire roller assembly may not be centered relative to the aperture and intermittent sprocket. Any of these defects requires the roller assembly to be removed for cleaning, lubrication, and readjustment.

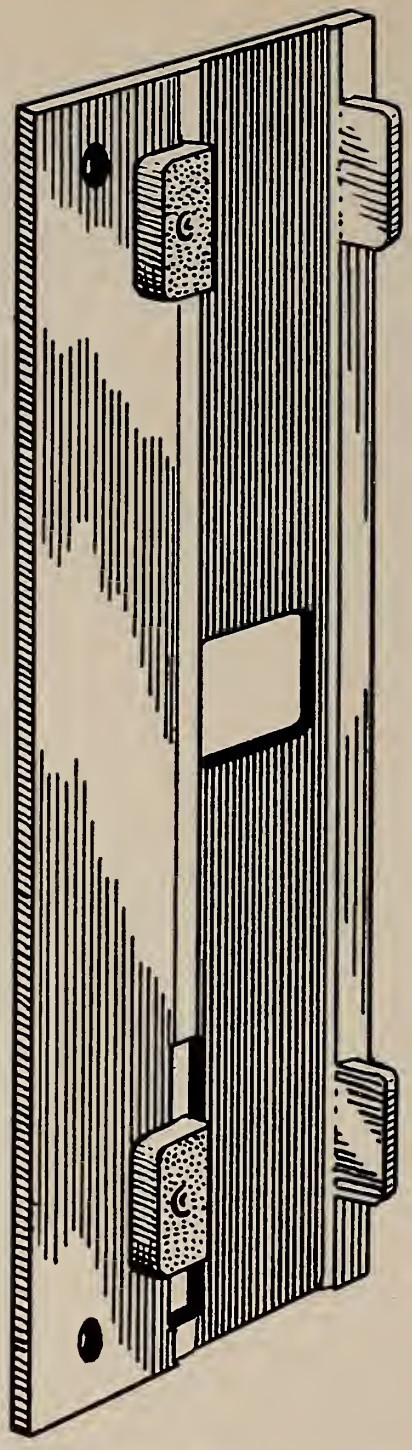


FIG. 2 — The film is guided both above and below the aperture in a 16-mm projector intended for television broadcasting. Instead of rotating flanges, stationary guides are used. These are faced with wear-resistant sapphire or osmium-iridium, and the two outer guides are backed by tension springs. Note that the "guided edge" of 16-mm film is on the inside, the reverse of 35-mm practice.

The tension of the small spring which "loads" the movable flange (drive side) should not be too great. If the upper loop flutters erratically or buckles at the guide roller, the spring has too much pressure. This is a common cause of excessive sideweaving.

Ordinarily, the tension is correct when the guide-roller spring is used as it is supplied by the manufacturer —excessive tension is produced by stretching the spring with the fingers. It is rarely necessary to do this. Excessive pressure can be reduced by cutting out and discarding a few coils of the spring or, better, by using a new spring which has not been stretched out of shape by pulling.

Be safe instead of sorry, and guard against dropping the pivots or their set-screws into the mechanism when removing the guide-roller assembly from the machine. These vitally important parts are small and easily lost. Take the assembly completely apart, clean the shaft and flanges thoroughly, and lubricate the flange-shaft with a trace of vaseline. (Machine oil is too thin—the intense heat at the gate will burn it off.) It is not necessary to oil the ends, which are contacted by the pivots.

Some guide rollers have a collar and set-screw for lateral adjustment: in Simplex projectors they are adjusted by the pivots, which are held in place by set-screws. In any case a guide-roller flange should never be allowed to rub against the gate casting; and the film should be centered in the gate. The guide roller should never be moved more than 1/32 of an inch from its median position. If the edge of the soundtrack is visible on the left-hand edge of the screen, or the edge of the perforation margin of the film on the right-hand side, the centering of the guide roller should be investigated first, then the centering of the aperture plate. (See the end of this article for centering instructions when studio guide rails are used.)

The camera aperture employed in standard non-anamorphic 35-mm photography is 0.868 inch wide; the projector aperture has a width of 0.825 inch. There is thus a "leeway" of only 0.043 of an inch—approximately 1 millimeter—in the centering of the film in the gate. Expressed as a percentage, this allowable leeway amount to only 5% of the width of the projected picture.

CinemaScope prints are even more critical with respect to the centering of the film. The printed picture is also 0.868 inch wide, but the projector aperture has a width of 0.839 inch (1:2.35 aspect ratio), a difference of only 0.029 inch (3/4 mm). This amounts to approximately 7% of the

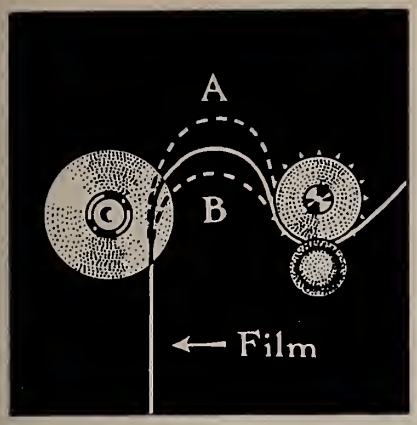


FIG. 3 — The presence of part of the upper film loop between the two flanges of a theatre-mechanism guide roller unavoidably handicaps the functioning of the device. In your own projection room, carefully observe the action of the upper loop at this point while film is running through the machine. If the film flutters excessively and tends to "pinch out" from the flanges, the tension of the guide-roller spring may be too great. See accompanying article for suggestions.

anamorphically expanded picture width, or only 3½% of the non-anamorphosed width.

As projectionists know, the film-processing labs occasionally foul up the centering of picture and soundtrack on the film. We recently saw a color print having a soundtrack which sporadically weaved into the picture area far enough to show the left-hand side of the screen as a conspicuous purple line!

The film should cause the flanges of the guide roller to revolve slowly while the projector is in operation. This is very important, since non-rotating flanges quickly become scored. The pivots should therefore not hold the roller so tightly that rotation is prevented; and the opposite extreme of a loose roller is dangerous and productive of severe sideway.

Believe it or not, uneven pad pressure in the gate, itself, is a frequent cause of sideway. Any difference in pressure on the two margins of the film tends to move the film off to one side, overworking the delicately adjusted guide roller. **The pressure on both margins of the film should be the same,** that is, if the total gate tension is 12 ounces, each side should exert 6 ounces. The two sides may be tested individually with a spring scale and a short strip of film cut in half lengthwise.

What should be done about the studio guide rails in the later flat-gate mechanisms? As edge-guiding devices they are useless, and even harmful, as previously explained. It is the lateral guide roller, alone, that does the work of steadying the film laterally. A few projectionists remove the rails in order to avoid the rapid and sudden weaving movements made by film oscillating between them, "bouncing" back and forth from rail to rail.

The writer appreciates the projectionist's dilemma, and recommends that the projected pictures be scrutinized for a few days in order to detect the presence of jerky sidewise movements attributable to studio guides, and which are most noticeable during CinemaScope projection. Remove the guide rails if the sideweave is bad enough to be objectionable.

If studio guides are used and retained, the outer guide rail is used as a reference when centering the lateral guide roller. Place a straight-edge against the **film-guiding (inside) edge of the outer guide rail** and extend it to the fixed flange of the guide roller above. Then loosen the two guide-roller pivot set-screws and move the pivots as required until the film-guiding surface of the fixed flange is in exact **alignment** with the film-guiding edge of the outer guide rail.

The preceding instructions must be followed by projectionists operating Simplex E-7 and X-L mechanisms having flat gates with studio guide rails. **iP**

25-30 Club Sets Jan. 11 For Annual Banquet

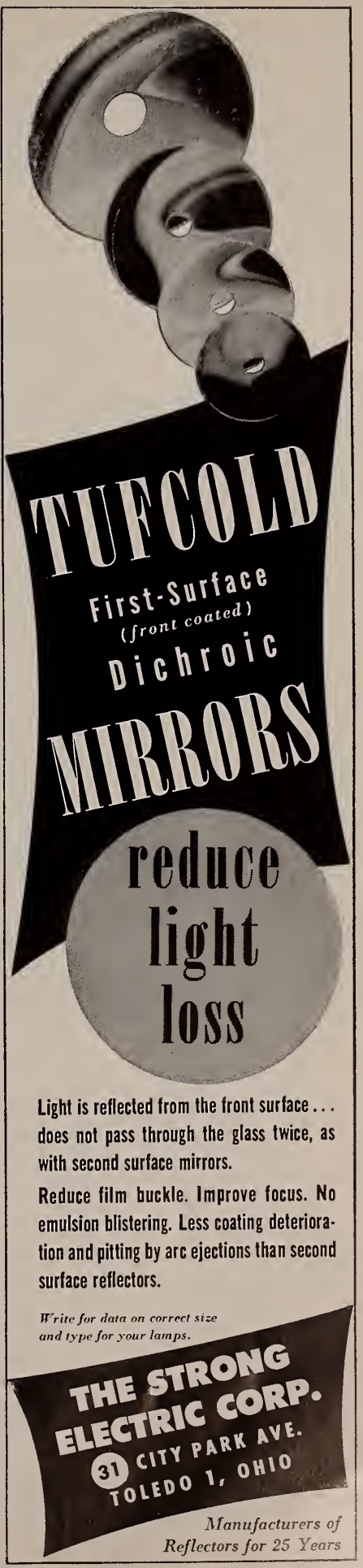
NEW YORK — The 25-30 Club's annual banquet will be held January 11, 1962 here. This was ratified at the Club's recent meeting in the Claridge hotel.

The meeting appointed a five-man committee to arrange the affair and select a site for the banquet. The committee consists of Joseph W. Engle, president; Arthur Silverman, vice president; Morris J. Rotker, recording secretary; Jack Krimon, financial secretary, and Morris I. Klapholz, editor of the Club's bulletin.

Engle presided at the meeting and supplied refreshments — stimulating beverages and cakes — for the after-session in his appreciation to the membership for helping make his administration successful.

A new member of the club was sworn in by Jack Krimon. He is Edgar Heidelberg, who was a projectionist for 25 years with RKO Theatres, and did a stint of five years as projectionist of Republic Picture's screening room in New York.

The 25-30 Club includes members from throughout this country and Canada. **iP**

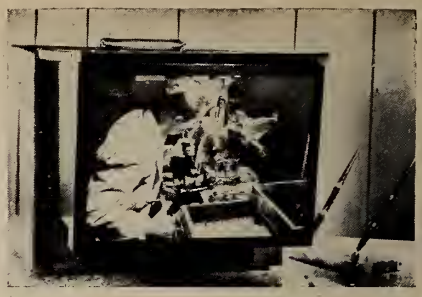


Elgeet Optical Takes Over Vicom

David Goldstein, president of the Elgeet Optical Co., has announced the acquisition of Vicom, Inc., as a wholly-owned subsidiary of the Elgeet Optical Co.

Vicom has a record as specialists in the audio - visual - communications field. It introduced the first 8mm sound projector with built-in rear projection as an aid to education, in-plant training and as a portable and highly effective sales tool.

Fred E. Aufhauser, the general manager of Vicom, will continue as the operating head of the Vicom Division of Elgeet. Aufhauser is a well-known pioneer in the entire area of projection and audio-visual products. In 1948, Mr. Aufhauser became president of Projection Optics. He was instrumental in developing and marketing theatrical projection lenses, fixed and variable focus anamorphic lenses for Cinemascope and wide screen pro-



Vicaudio Rear Projector

jection; and overhead and opaque projectors and was the first person to introduce an 8mm sound rear projector.

Vicom was formed to manufacture and market the Vicaudio, the original 8mm sound rear projector, enabling direct, head-on projection plus recording and playback features. The Vicaudio also has the versatility of using standard projection reels in addition to continuous magazines and repetitive programs.

Vicom also marketed such products as the Visual Image Compensator, an attachment lens which converts 70mm and 35mm motion picture prime projection lenses to wide angle lenses of half the original focal length with superlative image quality.

Aufhauser will assist Goldstein in developing and marketing a full line of audio-visual equipment and related products.

The Vicom Division of Elgeet announced the introduction of a new, lightweight model 8mm sound projector with a built-in 9 in. x 12 in. Rear Projection Screen. The Vicaudio Mark II weighs less than 18 lb., is completely portable and offers continuous projection, wherein the magazine automatically rewinds the film during projection.

The extreme portability and ease of operation of the Vicaudio Mark II makes it ideally suited for use by salesmen in presenting a vivid presentation, complete with sound, to their prospects or for schools, showrooms, industrial training programs and for displays at conventions and trade shows. **iP**



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SPOTLIGHT BROCHURE

A new brochure on direct current carbon arc follow spotlights for theatres has just been issued by the Strong Electric Corp., 10 City Park Avenue, Toledo 1, Ohio. Designed for throws of 100 feet or more, the projected spot is variable from a minimum of 27-in "heat spot" to a maximum of 75-ft. flood. The equipment incorporates an automatic carbon feed device. A copy of the brochure will be sent free on request. **iP**

Returns from Tour, Likes U.S. Equipment

William A. Mueller, veteran Hollywood sound director, has just returned from a two year tour as sound and motion picture consultant to the Indonisian government. Mr. Mueller's services were supplied by the U. S. State Department. He is presently consultant for M.C.S. Films in Munich, Germany and is making a survey of the latest American sound techniques and equipment.

Mueller will be remembered as the former sound director for Warner Bros. Studios, where he won several Academy Awards and International fame.

He reports that the 70mm multiple film productions with 6 channel stereophonic sound are very popular and profitable in Germany. "Exhibitors are clamoring for this product, they have the newest theatres and equipment in which to run these pictures."

Mueller stated that he was "tremendously impressed" with the new Century transistor sound system and especially with the multiple channel models. The Century 70mm projector with the 6/4/1 channel sound systems were particularly impressive. He considers those sound reproducing systems to be the greatest advancement in sound reproducing equipment that he has seen to date. Mueller has several assignments under consideration and expects to accept one of them for permanent location here. While in New York, Mueller will exchange ideas with Earl Sponable, Frank E. Cahill, Jr., and other prominent engineers. **iP**

Beach in New Post At Kodak Park Works

ROCHESTER, N. Y. — Norman F. Beach was named assistant general manager of the Kodak Park Works in a list of six executive appointments announced by Clarence L. A. Wynd, Eastman Kodak Co. vice president and general manager of the Kodak Park Works.

Lloyd A. Smith and Walter A. Fallon were appointed assistant managers of film emulsion and plate manufacturing; John W. Parker was named superintendent of the film emulsion division; Robert A. Chasey and Dr. Harry R. Beilfuss were appointed assistant superintendents. **iP**

THOMAS BRIGHTON

CHICAGO — Thomas Brighton, long a member of Local 110, Chicago Moving Picture Machine Operators Union, died recently in Canoga Park, California. Services were held there. **iP**

BalCOLD® REFLECTORS STOP FOCUS DRIFT

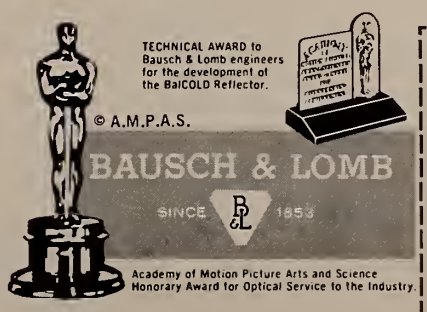
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New York State Projectionists Celebrate 50th Anniversary at Fall Meeting

By GEORGE F. RAAFLAUB
Secretary-Treasurer

The Annual Fall Meeting of the New York State Association of Motion Picture Projectionists was held in Utica, N. Y., recently at the Hotel Utica, with the largest attendance of delegates and guests ever to be present at an Association meeting.

Projectionists came from far and wide, as the Association meeting was held in conjunction with the 50th anniversary of Local No. 337 of the I.A.T.S.E. & M.P.M.O. of the U.S. & Canada.

International president Richard F. Walsh was honored guest for the day, accompanied by assistant president Walter F. Diehl and wife and International representative Richard Scott and wife.

Local No. 337 played host at a fine luncheon which was served to all delegates and guests. Local No. 337 also arranged a tour for the ladies of the Auxiliary and guests to the Oneida Community Silver Plant located just west of Utica. This tour, as was the Utica Club Brewery tour, was enjoyed by all.

Under the capable direction of William H. Ingram of The Schine Projection Service Department, Rochester, N. Y., the technical program was one of great interest to all the delegates. Arthur T. Hatch, president of the Strong Electric Co., Toledo, Ohio, lectured on "A Gleam In The Movie Patron's Eyes." This fine subject was followed by a question and answer period with Mr. Hatch answering all questions to the delight of the delegates. (See article.)

Ray Gallo, general manager of the INTERNATIONAL PROJECTIONIST, gave a very enlightening talk on "Plight of Projectionists in Today's Shrinking Theatre Market", which went over big with the delegates.

The regular business session of the association, conducted by E. Francis Larham, president, brought up many items of interest to the delegates. Several discussions took place pertaining to the craft, with President Richard F. Walsh called upon to give his views on some of them.

Delegate H. Paul Shay, secretary-treasurer of the 10th District, presented President Walsh with a bank filled with coins and bills collected at association meetings over the past three years. President Walsh said he was very happy to accept such a fine gift and would turn the contents over to the Will Rogers Memorial Hospital at Saranac Lake, New York.

George R. Raaflaub, secretary of Local No. 376, Syracuse, N. Y., was unanimously elected secretary-treasurer of the association to fill the unexpired term of Brother Charles F. Wheeler who served as secretary-treasurer for many years. (Brother Wheeler passed away on July 15, 1961.) A suitable resolution was read on Brother Wheeler's passing and all delegates stood in silent prayer out of heartfelt respect to his memory.



IATSE OFFICERS AT UTICA—Officers from the IATSE were present during the meeting of the New York State Projectionists; they are shown above with some of those serving IA from the area. Left to right are H. Paul Shay, secretary-treasurer; Walter Diehl, assistant International president; Richard F. Walsh, International president, and Richard Scott, IA representative. Photo by Nicholas Cullen.

Delegates from Local 306 and the 25-30 Club, both of New York City, were in attendance, with Local No. 306 becoming a regular member of the state association. Brothers Ben Olevsky, chief projectionist of Radio City Music Hall and his assistant chief projectionist, William (Bill) Nafash, were on hand to help celebrate the joint occasion.

After the business session, Messrs. Phil Freeman, A. B. West and James Naughton, representing the National Carbon Co., played host at a cocktail hour for all present.

The climax of a great day was the banquet celebrating the 50th Anniversary of Utica Local No. 337. This affair was highlighted by Judge John J. Walsh (no relation to Dick) presenting president Richard F. Walsh with a key to the City of Utica, and reminding Dick that IA members will always be welcomed to the fair city of Utica. The father of Judge Walsh was for many years the top labor leader and labor organizer in Utica and surrounding areas.

Jerry George, manager of the National Theatre Supply in Buffalo, presented President Walsh with a check for $50 collected from the sale of carbon drippings turned in by projectionists. President Walsh said that this, too, would be turned over to the Will Rogers Memorial Hospital and reminded the IA members present that they or any member of their family are treated free of charge at the hospital.

President Walsh delivered the main speech of the evening and a loud applause greeted him at its conclusion.

Other theatre notables at the affair were: Robert Kallet, president of the Kallet Chain Theatres and wife; Charles Smakwitz, divisional manager of the Stanley-Warner Corp., Charles Christensen, business agent of Stage Employees Local No. 128 and wife, and many area theatre managers and wives.

Rocco Monaco, business agent of Local No. 337 and the members of the Utica Local were congratulated on the arrangements for this gala affair. The delegates of the state association were honored to have had a part in sharing their happiness in this, their 50th anniversary in the International Alliance.

A most wonderful day was had by all with everyone going home hoping they will be invited to Utica again.

The INTERNATIONAL PROJECTIONIST is the official Trade Magazine of the New State Association of Motion Picture Projectionists. **iP**



AT UTICA MEETING—Suppliers and the projectionists' trade press representative at the Utica meeting are shown above. Left to right are Ray Gallo, New York general manager of INTERNATIONAL PROJECTIONIST, a speaker on "The Plight of Projectionists in Today's Market"; Jim Naughton and Phil Freeman of National Carbon Co.; Arthur Hatch, president of Strong Electric Co. and author of the article in this issue; Bill Ingram of the Schine Service, Jerry George of National Theatre Supply and J. Winick of Camera Equipment Co. Photo by Nicholas Cullen.



ON DUTY — A battery of Strong Electric Co. Super-Trooper Trouper spotlights are ready for action, as shown above, at the new McCormick Place Theatre in Chicago, designed by IA member John Ditamore, Local No. 174, Lafayette, Ind.

SMPTE Elects New Officers to Serve Two-Year Terms

NEW YORK — Results of the recent elections by the Society of Motion Picture and Television Engineers of officers and governors to serve a two-year term, 1962-63, were announced by J. W. Servies, president of the society.

Dr. Deane R. White, associate research laboratory director of E. I. du Pont de Nemours & Company, Parlin, N.J., was reelected as engineering vice president.

Ethan M. Stifle, manager of the East Coast division of Motion picture film department of Eastman Kodak, New York City, was reelected financial vice president of the Society.

Also reelected as sections vice president was Garlund C. Misener, vice president in charge of laboratory operations for Capital Film Laboratories, Washington, D.C.

Wilton R. Holm, manager of the motion picture products sales office of E. I. du Pont de Nemours, Hollywood, Calif., was elected to the position of treasurer, succeeding G. Carleton Hunt, General Film Laboratories, Hollywood.

From the Eastern area of the country, the following have been elected governors of the Society; Harold Jones, commercial developments department of Ansco, Binghamton, N.Y., and Richard E. Putman, manager of studio and industrial TV engineering, General Electric, Syracuse, N.Y.

George W. Colburn, president of George W. Colburn Laboratories, Chicago; and Howard W. Town, technical director, National Educational TV and Radio Center, Ann Arbor, Mich., were named governors from the Central area. Elected governors to represent the Western region were: G. Carleton Hunt, and Edward H. Reichard, chief engineer, Consolidated Film Industries, Hollywood. **iP**

How to Keep the Gleam In the Theatre Patron's Eye

By ARTHUR J. HATCH
Strong Electric Co.

WE are all interested in the attitudes and reactions of the movie patron, because he is the source of income which supports you and me.

The patrons who attend the theatre in which you practice the art of projection are influenced by the many qualities they see, feel, hear or smell in the theatre. Most of these qualities can be separated into two general groups.

First: The qualities put into the film by the producer, story, cost, photography, sound — the most successful film usually contains the greatest number of quality factors.

Second: The qualities of presentation are equal or more important. These factors include the sound, light, projection including focus, color, absence of distortion and flicker, as well as bodily comfort such as seating, temperature, restroom cleanliness and comfort and courteous reception and attention by staff.

This latter quality group is one that is locally controlled by — and the entire credit or discredit goes to — theatre management and staff.

This second group of qualities is also most important in securing the continued business of the patron. He knows that the next time the quality of the film will probably be different, but he will be convinced that the quality of presentation will be the same.

Keeping a good light on the screen is one of the most important of these qualities and one that will put "a gleam in the eyes of the movie patron" as he views that trailer and anticipates another evening watching a good movie well presented. Careful operation and maintenance of arc lighting equipment will do much to cause the light from the screen to initiate the gleam which causes a return to the theatre — I would like to touch on some of these operation and maintenance factors.

To begin with, of course the required amount and distribution of light on the screen has been carefully defined by the SMPTE and incorporated in an American Standard. This newest Standard adopted May 5, 1961, is for 35mm, 24 frame per second projection to indoor screens. Copies are available at a nominal cost from the ASA at 10 East 40th St., New York 16. This new Standard defines the screen illumination by three principal requisites as follows in the following condensation:

1. **Luminance at center of screen shall be 16 ± 4/6 ft. lamberts as measured from a point on longitudinal centerline of auditorium and 2/3 distance from screen to rearmost seats, with shutter operating but with no film in projector.**
2. **Luminance at distance of 5% of screen width from side edges on horizontal axis shall be within 65-85% of center luminance as measured.**
3. **The luminance at all points on horizontal axis between 5% sides shall be between 5.5 and 20 ft. and with no greater range than 3:1 as measured from any seat in auditorium.**

Having a lamphouse capable of projecting the recommended light levels however unfortunately does not always insure that these values of sparkling white light will be obtained throughout the double reel. If it is necessary for the projectionist to make a manual feed adjustment once, twice, thrice or any number of times during a reel the quality of the light on the screen is bound to change. Only properly adjusted and maintained lamps are capable of operating through a double reel without manual correction.

Many projectionists still try to apply control adjustment procedures they learned in the days of the low intensity arc, and which are not usually applicable to modern high intensity projection arc lamps. A quick review of the basic principles of operating present-day high intensity projection lamps establishes the simplicity of their operation. In general, the motor speed adjustment determines the actual arc current that will be obtained while the setting of the generator ballast or rectifier control determines the length of the arc gap. The slow drift of the carbon electrodes either in one direction or another is controlled by various means, depending on the particular type and make of lamp.

For instance, in the low power, copper coated, single lead screw type of lamp, one carbon is driven by a carriage riding along one end of a lead screw with a certain pitch thread while the other carriage is driven by the other end of the same lead screw with a different pitch thread. The pitch of these two threads are selected so that at a certain amperage the carbon will be advanced exactly as fast as their respective burning rates.

This type of lamp can be operated only at one arc current with a given set of electrodes. With this feed system, the motor control is increased or decreased until the drift of the arc gap becomes zero and the electrodes stay in correct position to the reflector.

If the arc gap is drifting away from the reflector, the motor control is lowered slightly and if the gap is drifting towards the reflector the motor control is increased slightly until stability is reached. The length of the arc gap as in the general case is the function of the power supply setting. If it is necessary to increase the gap length, the power supply is increased.

Another type of arc lamp using the copper coated carbons has a single motor for driving both the positive and negative carbons, the positive being driven directly and the negative at a variable rate through a cam and clutch arrangement. With this type of lamp as in the general case, the motor is adjusted until the desired arc amperage

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• PERFECT COLOR BALANCE
Free Carbon Chart

is obtained. This motor speed adjustment should then be forgotten and other adjustments used to obtain the correct arc operation. The slow drift of the negative and positive in one direction or the other is controlled by the setting of the cam on the negative feed. The gap on spacing of the electrodes is controlled by the setting of the power supply.

Modern high intensity rotating black carbon lamps of the most advanced design are usually equipped with two motors, one for driving the positive and one for driving the negative carbon and are equipped with an automatic positive crater positioning system which automatically maintains the light source at the focal point of the reflector. These lamps, in addition, usually have only a single feed adjustment which is set to produce the arc amperage required, and is usually calibrated in terms of carbon burning rate. The only other adjustment required in the operation of this type of lamphouse is to obtain the correct setting of the power supply so that the proper potential or pressure is maintained between electrodes, thus establishing the arc gap length.

Regarding lamphouse maintenance items, carbon alignment is one of the most important. Carbons can get out of alignment very easily and should be checked periodically. Observe how the face of the crater is formed and whether the slope of the face of the crater changes in its attitude throughout the trim of carbon. If the face of the crater usually changes with some set pattern as the carbon rod is consumed, this will in all probability indicate some misalignment of the electrodes. The instruction book of the manufacturer should be followed in all instances for realigning the carbon carriages or contacts.

Lamphouse alignment to the projector is also most important and should be checked periodically. Use the aligning tool usually furnished by the lamp manufacturer, or if this is not available a simple type using a piece of string can do a good job.

When aligning lamphouse to projector there are four check points that should be in a straight line. Two of these referenced points should be on the lamphouse and usually are either two points along the axis of the positive electrode in lamps having a shadyrest and a carriage or the positive contacts and the center of the light opening in the nose of the lamp in lamp types with positive roller feeds.

The third check point is in the center of the aperture and the fourth check point is in the center of the lens barrel or lens holder. Simple dummies to locate these center points can be constructed and placed at the above mentioned check points so that a piece of string running through the center holes of these dummies will be straight alignment if the lamphouse is properly in position.

A proper draft system will exhaust the products of combustion and keep the lamphouse cool and relatively free from soot collection. Never allow an installation to be made in which there is a reduction in the area of the exhaust pipe to a lower value than the area of the lamphouse chimney opening as set by the lamp manufacturer. Proper air flow and control cannot be obtained by placing dampers in the exhaust pipe to regulate the flow of exhaust gases.

Install Control Damper

The best practice is to install a control damper in a bypass branch to control the amount of bypass and exhaust air. The proper amount of exhaust air should be as specified by the lamp builder, but if you do not have these specifications available, a handy rule of thumb for the minimum cubic feet of air per minute required is to multiply the arc voltage by the arc amperage and divide this product by 40. This for the 1 KW type lamp which burns at 30 volts and 40 amperes or with a power of 1,200 watts, divided by 40 will indicate a minimum of 30 cubic feet of air per minute. For the copper coated 70 ampere operation the lamphouse wattage is 2,800, and applying the rule of thumb for indicating a minimum, 70 cubic feet per minute is required. Black carbon lamphouses operating at 100 amperes and 150 amperes require 160 and 270 cubic feet per minute minimum respectively by this same rule of thumb.

Related to proper draft is reflector deterioration and breakage. Breakage is usually caused by a collection of soot

Charles Gresty Dies While on Vacation

TUCSON, ARIZ.—Charles Henry Gresty, 60, died last month in Durant, Okla., while on a vacation trip. A native of Emmettsburg, Iowa, and a Tucson resident for 13 years, Charles was a member of Tucson Local 415 (M) of the IATSE, affiliated with that local in October of 1951.

He is survived by his widow, Mrs. Nettie G. Gresty.

Mr. Gresty was projectionist at the Catalina Theatre in Tucson. **iP**

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on the reflector which causes localized heating due to the absorption of heat from the arc by the soot in contrast to reflection of the heat of the arc by the clear portions of the reflector. The best practice is a daily cleaning of the reflector with a soft cloth. It is permissible on second surface silvered reflectors to use a steel wool pad to remove obstinate scum.

On the first surface cold type reflectors it is recommended that a good grade of alcohol be used for cleaning purposes. It is well to check the screen light regularly as even the best of screens and reflectors deteriorate gradually over a period of time. If these two reflecting mediums deteriorate only 1% every month in a two year period there will only be 75% of the illumination from the screen that there was when reflector and screen were new.

Avoid Excessive Oiling

As far as lubrication is concerned, the best recommendation is to follow the manufacturer's recommendation. Avoid excessive oiling and do not oil guide and slide rods in the 1KW type of lamps. Use special heat resisting lubrication when recommended by the manufacturer and avoid the use of graphite.

Other daily maintenance practices advocate including cleaning carbon contacts using a soft wire brush and cleaning out the lamphouse using a small hand brush. These simple practices will insure cleanliness, a great step in obtaining reliable lamphouse operation. **iP**

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Morris Rotker Operated 12 Hours for $1.43; Fathered the Shift Pact for Projectionists

Not only motion pictures but also projectionist status grew during the 51 years Morris Rotker was active as an operator. Indeed, he actively participated in the first contract whereby the shift system for projectionists was established in this country.

Starting as a teenager in 1907 as operator of a storeroom movie show in Chatham Square, in the heart of New York's Chinatown, his pay was $10 per week—for seven days a week from noon to midnight.

Morris retired as a projectionist in 1958 to become the secretary to a municipal court judge in the Bronx. He still proudly shows his union card as a member of Local 306 and is secretary of the 25-30 Club, which he organized with the late Arthur Lichenstein and Joe Abrams. The Club, a social get-together for projectionists with 25 years or more as a working projectionist, now has 400 members in the U.S., Canada and overseas.

The amazing strides made by the movies since the nickelodeon days can be gleaned from the incidents and episodes Rotker can cite from his own experiences. It's a long way from the movie showcases of today to the Bowery store show Morris worked as an operator in 1907. He recalls that a Chinese sketch artist would start a drawing in the store window and suddenly stop, whereat Morris would start a phonograph whose cylinder record would blare out "everybody inside for a nickel." The show consisted of 50 or 60 feet of film, which the operator would pick up from the exchange.

There were no unions in that day, so projectionists would gather in Fourteenth Street outside the General Film offices to pick up jobs from exhibitors. Eventually, Morris says, the operators got together and if one were approached by an exhibitor and told his price for the job, by the grapevine other operators would demand the same wages, so the exhibitor would go back to the first man and hire him.

When the first permits were issued by the Water Supply Gas and Electricity Department of the City of New York, all an operator had to do was state his age (no proof needed, and many of the men were under the demanded age of 21) and "the inspector would show him a fuse and if the operator could identify it as a fuse, the applicant would get a permit."

Later when the projectionists were taken in by a theatrical union as spotlight men, the operators of that day used to get jobs working spotlights for election campaign rallies and parades. Morris got a job from the Republican campaign committee to project a film on an improvised screen on a truck outside old Madison Square



Morris Rotker

Garden when Charles Evans Hughes was the Republican candidate for President in 1912. An "act of God," in the form of a big wind, tore the canvas screen just as Rotker was to start the show.

Morris finished his projectionist career when he left the RKO Marble Hill Theatre in the Bronx after 15 years in the booth of that theatre.

During his activity as a boothman, Rotker filled offices of IATSE Local 306. He is a former secretary, vice president and chairman of the examining board of 306. He participated in the contract which was the first to specify shifts for projectionists and it is believed to be the first two-year pact between exhibitors and the Union.

According to many people, who saw him work as an organizer and get-things-done-man, writing charters and contracts for organizations, Morris Rotker missed his vocation, "he should have been a lawyer," they said.

Well, he is now secretary to Judge Sidney H. Asch of the Municipal Court in the Bronx. And during the recent campaign for reelection of Judge Asch, Morris campaigned with the Judge.

Morris Rotker took a leading part in activities of many organizations, patriotic, civic and fraternal as well as in business. His collections of citations and scrolls range from the U.S. Treasury (for selling almost $1 million of bonds during the War) to plaques and certificates from fraternal organizations.

The 25-30 Club of Greater New York presented him with a scroll that

reads "In grateful appreciation of Morris J. Rotker as our president during 1947-48. His fine personal qualities were reflected in the highest type of leadership and unselfish devotion to the best tenets of this fraternal association. The Samaritan Lodge No. 1035 F&AM presented him with a scroll "in appreciation of his vision, initiative and effort in behalf" of the Lodge. These and other citations, including certificates of appointments by the mayor and public officials, testify to Morris Rotker's voluntary devotion to patriotic and civil and fraternal activities.

The IATSE Locals' copper scrap collections, which yielded many thousands of dollers to the Will Rogers Memorial Hospital in Saranac Lake, was suggested by Rotker — showing that Morris' active interest in the movie industry in which he spent 51 years as a projectionist. He relishes his past, present and what the future may bring in the industry which he says he is proud to have served as a man in the booth. **iP**

Fuzzy Pictures, Fuzzy Guy

Amongst the hundreds of reports of free technical service being given to theatre owners by equipment dealers under the program of the Council for the Improvement of Theatres and Motion Picture Projection, is an occasional chuckle, Albert M. Pickus, president of TOA and chairman of the Council, disclosed today.

Pickus said the most recent incident was a report made to him by a major projection service organization on the problems of the owner of a small theatre in the midwest, who complained his projection was not "sharp." The picture on the screen, said the owner, was fuzzy.

An equipment dealer made the first call. He returned with a field man from a projection company. Still the owner complained. They lent him a new pair of lenses. Still, said the theatre man, the picture was not sharp.

In desperation, the service supervisor of the projection company made a long trip to the theatre. His lengthy report to Pickus, summarizing all that had gone before, concluded with this sentence:

"Mr. X . . . . . (the theatere owner) finally admitted to me that when he put on his eyeglasses the picture was in focus."

P.S. There was no optometric charge for this service, Mr. Pickus said. **iP**

Davee Pushing TESMA Theatre Council Idea for All Segments of the Motion Picture Industry

NEW YORK—Larry Davee, as president of the Theatre Equipment & Supply Manufacturers Assn., is energetically pushing TESMA's proposal for an all-industry Theatre Advisory Council for raising the standards of screen presentations right where the public sees the motion pictures produced in Hollywood and around the world.

Prime function of the organization would be to act as one source of information to which theatre owners, producers, service firms and equipment manufacturers could turn to get advice about available equipment and newer developments and techniques.

Davee, who is president of Century Projector Corp., attended the recent convention of Theatre Owners of America in New Orleans to explain TESMA's idea to officials of the TOA and exhibitor groups gathered there. He had talks with TOA's new president, John H. Stembler (who is president of the Georgia Theatre Co.), looking toward meetings to advance the Council proposal.

Before the TOA convention, Davee had interviewed other industry groups to inform them on what the TESMA plan for a Theatre Advisory Council program would mean to producers, distributors, equipment manufacturers, dealers, service and concession firms and industry trade associations, in promoting theatre attendance by high standard screen presentations in comfortable, clean and modernized theatres.

Davee talked about the good such an organization would do for the whole industry, as a source of information on new developments and advancing processes and techniques. He says there's lots of information about such techniques and equipment but "they are couched in engineering terms and they are not understandable to exhibitors and even producers and directors. What is needed by this industry is information about technical problems and new processes and equipment in terms the layman can understand, and decide whether in his own judgement the new equipment will contribute to his long range advantage. Composed of all industry groups, the Council's information could be accepted by all branches of the industry.

Previously, Davee said the first year of the Council operation would cost about $50,000, and as it proved itself, as he is satisfied it would, the organization could be expanded.

The organization in the first year would have a director, a secretary and one staff member. The director's job would be traveling across the country visiting theatres and volunteer his services to the theatre owner, manager or projectionist about their problems and whether the exhibitor wants advice about a modernization program for his theatre.

If that idea, ideally carried out, the Theatre Advisory Council would be worth its weight in gold to the film industry. The forthcoming advice would be above the salesman's level and the exhibitor would not be confused about available equipment and could with assurance solve his minor or major problems—and if so needed go ahead improving his operation and his profits with good effect to the whole industry.

It would be good for the projectionist, whose suggestions to the theatre owner about improvements in the booth are taken for granted and sort of suspect that the workman wants to make his job easier, whereas the craftsman has pride in his work and, being a showman wants the theatre where he works to give the moviegoers high standard projection and sound, observers say.

Above the theatre level, the TESMA proposal is for an all-industry agency to promote theatre attendance by ideal screen presentation exhibits at state centennials or other events which draw large crowds from all parts of the country.

"Imagine," Dave said, "what a boost for the motion picture industry a modernized theatre at the forthcoming World's Fair in New York, with all the modern developments—stereophonic sound, excellent projection of all the new processes, and scenes from 'blockbuster' productions. Many people would be amazed about the industry's advancements, seeing such a demonstration, and the prestige of the 'movies' would zoom far and wide in this country."

Davee repeated his assertion that "Such a program is bigger than any single manufacturer, producer, distributor or exhibitor could handle. No exhibitor organization, no producing company, no concession company or any one single department of any group could accomplish this important work." **iP**

National Theatre Supply Orders Projectors; Turnbull Sees Improving Business

An order by National Theatre Supply Co., Tarrytown, N. Y., for manufacture of Simplex motion picture projectors and associated equipment with a selling price value of over $1,000,000 has been announced by W. J. Turnbull, president of National Theatre Supply, a subsidiary of General Precision Equipment Corp.

An increase in NTS theatre equipment sales during the past six months and a prediction of a continuation of the upward sales trend in the year ahead were also reported by Turnbull.

In a statement issued on the signing of the order placed with Pleasantville Instrument Corp., Pleasantville, New York, Mr. Turnbull said: "This large order for 35mm projectors, replacement parts and accessories represents another step in our marketing plans to strengthen the leadership position Simplex holds and will enable us to meet increased requirements for new theatres and for the modernization of existing theatre projection room equipment.

"The base for these requirements," Turnbull continued, "was laid in the increased sales activity we enjoyed over the past six months. Market surveys recently concluded by NTS indicate a continuation of the upward sales curve in the year ahead."

Production of the projectors, replacement parts, and accessories has started at Pleasantville, which is the manufacturing arm of GPL Division, General Precision, another subsidiary of General Precision Equipment Corp. **iP**

Evansville Ind. Local Wins 3-Year Boost

EVANSVILLE, IND. — The Moving Picture Machine Operators Local 367 reached a 3-year agreement with Premier Theatres Inc. of Evansville Nov. 2.

While the Local accepted a manpower cut in one of its downtown houses, substantial increases were made to the operators in both the downtown and suburban theatres of the local circuit, progressing over the duration of the contract.

Three year contracts were also signed during the summer with both of the Loew's theatres in Evansville, one of which had been closed. A manpower cut was accepted by the Local in Loew's also, coinciding with the retirement of one of its members. Substantial increases, totaling more than $25 weekly, went to each of these operators over the period of the 3-year contract. **iP**

Century Projector Corp. Steps Up Production Of Transistor System

NEW YORK — Century Projector Corp. plans to step up production of its transistorized sound system equipment, according to officials of the company, who said the new sound equipment has had substantial sales to theatres, new as well as replacements for the tube-type sound system.

The Century transistor system, in addition to eliminating vacuum tubes —even the photocell is replaced by a phototransistor—eliminates transformers, heavy condensers and preamps. **iP**

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Strong Introduces New Theatre Spotlight

A new incandescent follow spotlight for theatres, utilizing a 1,000-watt projection bulb and priced at $195, has been announced by the Strong Electric Corp.

Known as the Troupit Baby Spot, this spotlight has a suggested operating range of from 20 to 70 ft., although it may be efficiently used at from 10 ft. to project 354 foot candles, up to 70 ft. to project 6 foot candles. At 10 feet the maximum diameter spot is 4 ft. and the minimum 3 in., and at 70 ft. the largest spot is 31 ft. and the smallest 25 in.

The Troupit comes complete with two-element lens system, aluminized metal reflector, porcelain mogul base socket, nichrome steel iris, stand, switch and lead cord. A spot focus adjusting knob and vertical tilt locking pivot are also provided.

Literature will be sent to anyone addressing a request to Strong Electric Corp., 10 City Park Ave., Toledo 1, Ohio. **iP**

T. A. PETRE AT SARANAC

SARANAC LAKE, N. Y. — Tobe A. Petre, former projectionist at the Loop Theatre, Toledo, Ohio, has entered the Will Rogers Memorial Hospital here, and says he would be happy to hear from his friends and associates.

Tobe Petre is one of our veteran projectionists, who was compelled to leave his booth and retire to St. Petersburg, Fla., in November, 1957, because of illness. **iP**

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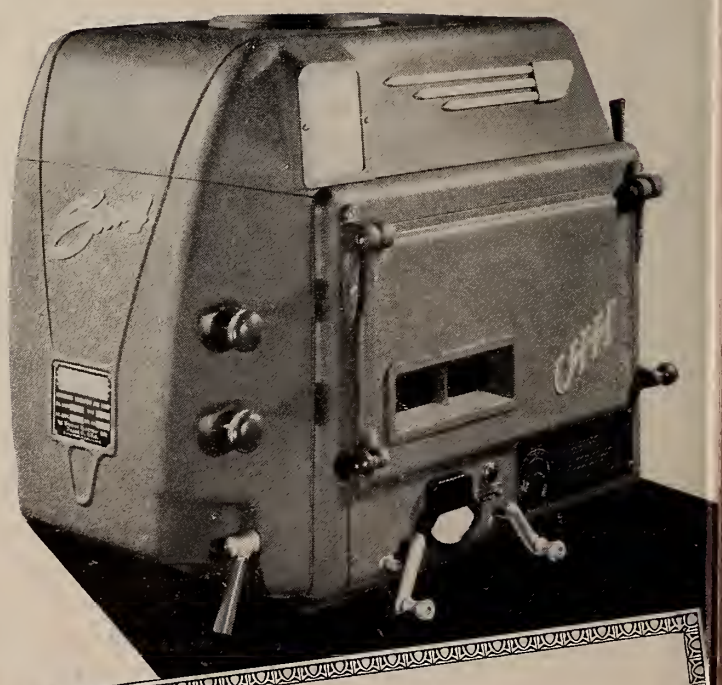
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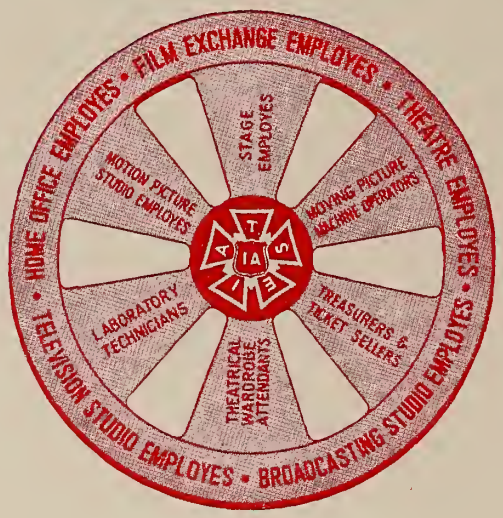
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Volume 36 December 1961 No. 12

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545 Fifth Avenue
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Murroy Hill 7-7746

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INTERNATIONAL PROJECTIONIST, published manthly by the Internatianal Prajectianist Publishing Ca. divisian af The Northern Publishing Co., Past Office Box 6174, Minneapalis 24, Minnesota. Editorial affices, 1645 Hennepin Avenue, Minneopolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizobeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnoy Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sans, Ltd., Macklin St., Landon, W. C. 2. Subscriptian Rates: United States, Canada, and U.S. Passessians, $3.00 per year (12 issues) and $5.00 for twa yeors (24 issues). Foreign countries: $4.00 per yeor and $7.00 far two years. Changes of address should be submitted four weeks in advonce of publicatian date to insure receipt of current issue. Second-class pastage paid at Minneapalis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility far personal opinions appearing in signed articles, or far unsolicited articles. Entire cantents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

Matching What We Have With What We *Should* Have

In this issue Bob Mitchell discusses one of the most difficult jobs in projection today — matching the multiple choices in aspect ratios against the many different varieties of screen sizes, shapes, and degrees of curvature.

Walt Disney Productions performed an all-too-rare service when they took the trouble to inform the projectionist (through the pages of the PRESSBOOK yet!) that the upcoming "Babes in Toyland" requires a 1:75 to 1 aspect ratio.

We need considerably more of this cooperation between the producer of the picture, the owner of the theatre, and the expert to whom is trusted the often-monumental task of presenting the widescreen, color extravaganza in the best way possible. It's too bad there isn't a closer, more sensible way of communicating with the theatre projectionist than through the pages of a pressbook, that's too often not read even by the exhibitor for whom it's intended (and, if the projectionist did go down to the office to see if there was any dope in it for him — he'd find that his part was on the back of the ad mat and was already on its way to the newspaper).

Let's have those who make the pictures and those who exhibit them consult more often with those who show 'em. How many times could the projectionist make valuable suggestions as to proper playing procedure, sound techniques, masking, etc.? How many times is he given the opportunity?

For a while, there was a determined effort to accept the projectionist as a member of the theatre team — he was present at the management-type meetings which settled all those problems touched on projection, and he was the one whose opinion counted when the choice inevitably arose: Do we chop off the subtitles or the heroine's fancy hairdo? Of late the practice has slid back into the customary pattern of mediocrity in all but the best theatres. The projectionist got tired of saying that the picture wouldn't show well unless the screen were were cleaned, the exhibitor saw all but the center three rows empty and decided he couldn't care less about holding theatre meetings, let alone meetings in which some fella was sure to suggest the spending of money on upkeep.

Many of the complaints would never have been voiced if the projectionist, many years back, had been allowed to explain the limitations forced on him by their equipment, the physical dimensions of their theatres, and the coming number of choices in anamorphic and "flat" pictures.

So — management should consult as often as necessary with the projectionist. For his part, the projectionist should take an honest interest in projecting the best possible picture with the equipment at hand, be willing to give his opinion and back it up with his best performance without resorting to one of the most unfortunate phrases ever to invade the language: "That isn't my job."

INTERNATIONAL PROJECTIONIST

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Non-Anamorphic Aspect Ratios: A Return to Sanity

By ROBERT A. MITCHELL

WHILE THEATRE MANAGERS are busily ballyhooing the super-duper width of their screens — "the widest screen this side of Radio City Music Hall," "the biggest screen in Punkin Center," etc. — quality-conscious projectionists have been waging a quiet war against the outsize aspect ratios which sabotage regular non-anamorphic 35-mm projection. Like the moviegoing public, projectionists are fed up with screen images magnified into a fuzzy wall-to-wall blur.

CinemaScope is ideally suited to enormous aspect ratios, and so is 70-mm film. These are the processes to use for aspect ratios of 2/1 (width of "field" 2 times the height) or greater. CinemaScope, for example, is designed for an aspect ratio of 2.35/1.

Standard non-anamorphic 35-mm prints simply cannot stand the severe "frame-cropping" necessary for these high aspect ratios. It doesn't matter how big the camera negative was: just so much light can be squeezed through the tiny aperture, and just so much image-resolution (lines per mm) can be squeezed into the print. The smaller the aperture is made, the worse the picture looks when it is blown up by short-focus lenses to a size which converts every seat in the theatre into a front-row seat — the kind of seat most patrons avoid like the plague.

1.75/1 Ratio Preferred

For quite some time it looked as though non-anamorphic projection would be standardized at an aspect ratio of 1.85/1. In some theatres, even 2/1 was used, the more closely to match the high aspect ratio of CinemaScope. But many projectionsts felt that 1.85/1, like 2/, was a "bit much" for non-anamorphic projection; and we now know that they were absolutely right. Judging from the gradual change from 1.85/1 to 1.75/1 in theatres of all shapes and sizes, suburban and downtown, there must be a large number of projectionists who know the difference between good and lousy projection.

Fortunately, the moviegoing public does not seem to notice the slight reduction of picture width when the change is made from 1.85/1 to 1.75/1 for the projection of regular prints.

Rest assured, however, that theatre patrons note with pleasure the clearer, brighter, steadier pictures!

How much is picture width reduced by this change in aspect ratio? Well, if the width of the projected picture is 37 feet at 1.85/1, it is reduced to 35 feet (1 foot from each side) at 1.75/1 when the **same height of picture** is maintained with a lens of slightly longer focal length. Somewhat more of the frame is projected top and bottom with the 1.75/1 apertures; and the picture definitely has a better overall appearance — sharper, steadier, and slightly brighter.

Here are the measurements in inches of apertures for regular non-anamorphic projection. Observe that, as the aspect ratio decreases, the vertical dimension (height) of the aperture increases, passing more light to the screen and showing more of the film-frame, top and bottom:

2/1	0.825 × 0.412
1,85/1	0.825 × 0.446
1.75/1	0.825 × 0.471
1.66/1	0.825 × 0.497
1.375/1 (conventional)	0.825 × 0.600

Change Lenses with Apertures

This writer, therefore, favors 1.75/1 apertures in place of the 1.85/1 apertures formerly the most widely used. Of course, nothing is gained except a bigger picture top and bottom unless the lenses are changed to the next quarter-inch longer focal length to decrease slightly the excessive magnification and maintain the original predetermined height of the projected field. **It is largely the reduction of image magnification that increases the quality of the projected picture.**

If lenses of 2.50 or 2.75 inches E.F. are being used for 1.85/1, little can be done because the next longer lens sizes would reduce the size of the picture too much. If the presently used 1.85/1 lenses range from 3.00 to

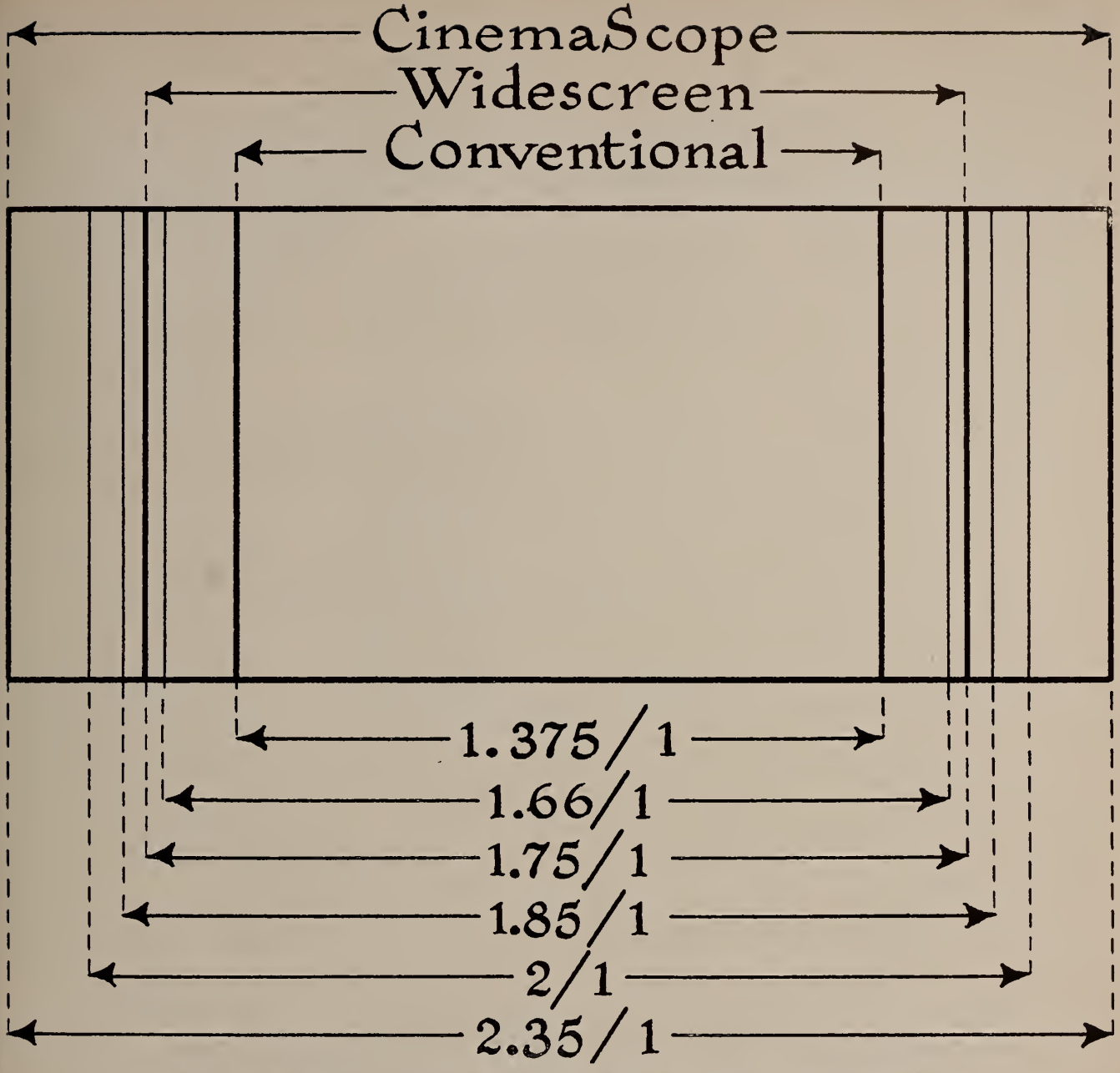


FIG. 1 — A graphic comparison of all the aspect ratios commonly used.

3.50 inches E.F., a change to the next quarter-inch longer lenses with 1.75/1 apertures will reduce the height of the picture not too excessively; and the small difference can be taken care of with the top and bottom screen masking strips, or by filling the apertures. If the present 1.85/1 lenses range from 3.75 to 6.00 inches in E.F., however, the change to the next quarter-inch longer E.F. lenses with 1.75/1 apertures will preserve the original picture height almost exactly. It's the closest height-matching possible with available standard lenses. For example:

If 3.75″ lenses are now used with 1.85/1 apertures, change to 4″ lenses and 1.75/1 apertures. If 4″ lenses are now used with 1.85/1 apertures, change to 4.25″ lenses and 1.75/1 apertures, and so on down the line. It's as simple as that; and you can't go wrong.

Many projectionists prefer to use their CinemaScope apertures and prime lenses as the "reference" in matching up aperture-lens combinations for standard projection and setting the top and bottom masking masking strips of the screen in one permanent position to accommodate all formats. This is a good idea.

Now, all CinemaScope apertures (whether for 2/1 or 2.35/1 aspect ratio) measure 0.715″ in the vertical dimension. To find the right focal length of lens to use with 1.75/1 apertures giving substantially the same field height on the screen as CinemaScope, use the following table (Table A), which lists the E.F. of the CinemaScope prime lens in the left-hand column and the E.F. of the lens needed for 1.75/1 non-anamorphic projection in the right-hand column. No calculations are necessary.

The symbol (h+) means that the picture height is unavoidably slightly oversize, and (h−) that it is slightly undersize. The difference can be absorbed by the screen masking. Other lens equivalents are very nearly "on the nose."

(Please turn to next page)

C'SCOPE PRIME LENS E. F.	E. F. REQUIRED FOR 1.75/1 REGULAR PROJ.
3.50	2.25 (h+)
3.75	2.50 (h—)
4.00	2.75 (h—)
4.25	2.75 (h+)
4.50	3.00
4.75	3.00 (h+)
5.00	3.25
5.25	3.50
5.50	3.50 (h+)
5.75	3.75
6.00	4.00
6.25	4.00 (h+)
6.50	4.25
6.75	4.50
7.0	4.50 (h+)
7.5	4.75 (h+)
8.0	5.25

TABLE A

Slightly undersize apertures can be filed out larger without much difficulty, though the job is a delicate one. If all apertures and lenses are properly centered in the mechanism, an undersize aperture will have to be filed along its top and bottom edges by an equal amount to match the height of the CinemaScope picture. Aperture plates are usually made of soft brass, hence the danger of inadvertantly removing too much, or of filing the edges unevenly. Frequent testing by actual projection (projector running, but without film) is the best insurance against overfiling.

Captioned "Arties" Pose Problem

The influx of undubbed foreign films poses an especially tough problem for the American projectionist. These are the films in which an English translation of the foreign dialogue is "supered" on the bottom of the picture. Most films of this category are standard prints designed for showing at the old conventional 1.375/1 aspect ratio on 3:4-proportioned screens.

The difficulty involves inclusion of all of the printed dialogue without cutting off the actors' heads — which is likely to happen when an extreme aspect ratio is used and the picture is "framed up" to show the printing. Theatres specializing in art films of the more exotic variety wisely retain the old 3:4 format for dialogue-captioned presentations, saving the higher aspect ratios for dubbed or English-language films.

Happily, most of the current crop of English-captioned arties can also be shown at an aspect ratio of 1.66/1 without either losing the dialogue captions or decapitating the players. This is the lowest of the so-called widescreen aspect ratios, and the one originally championed by Paramount for showing 35-mm reduction prints of "horizontal" VistaVision filmings. Even so, the old conventional 1.375/1 ratio is safest for the dialogue-captioned oldies and for those rarer rolls of imported celluloid which play the all-nighters.

Table B, herewith, gives the focal lengths of lenses required for both of these lower non-anamorphic aspect ratios. The interested projectionist should choose the ratio best suited to his theatre, matching the lenses on the basis of the presently employed CinemaScope prime-lens focal length. As in the case of Table A, no calculations are needed — simply locate your CinemaScope prime-lens E.F. in the left-hand column and read across.

One A.R. for Non-Anamorphic!

If it be possible to get by with only one non-anamorphic aspect ratio for regular projection, it is certainly best to do so in order to avoid unnecessary fussing with extra sets of aperture plates and lenses. And we must once again recommend the 1.75/1 aspect ratio in place of the formerly favored 1.85/1 ratio for non-anamorphic projection. As we said before, and as you can see for yourself, the slightly lower ratio includes more of the frame and gives a better image even though it is still "widescreen." The theatre specializing in foreign-language art films will probably find it necessary to use the still lower 1.66/1 (VistaVision) or 1.375/1 (conventional) aspect ratios.

The very highest picture quality — brightest screen illumination, sharpest image, steadiest picture, etc. — is, of course, obtained with the old conventional aspect ratio with a lens of suitably long focal length. Many theatres, even a few in key metropolitan locations, still use the conventional 1.375/1 ratio for all regular non-anamorphic projection, reserving the full width of the screen for CinemaScope or 70 mm widefilm only.

Even though the old 3:4 format looks might good to us, most audiences seem to prefer a definitely panoramic effect; and this the 1.75/1 ratio achieves without unduly sacrificing picture quality or light. The art theatre projectionist will have to decide between 1.66/1 and 1.375/1 employing the former if a slightly panoramic effect seems desirable, and if there is no interference with the framing of the type of films normally presented.

Coated Lenses a "Must"

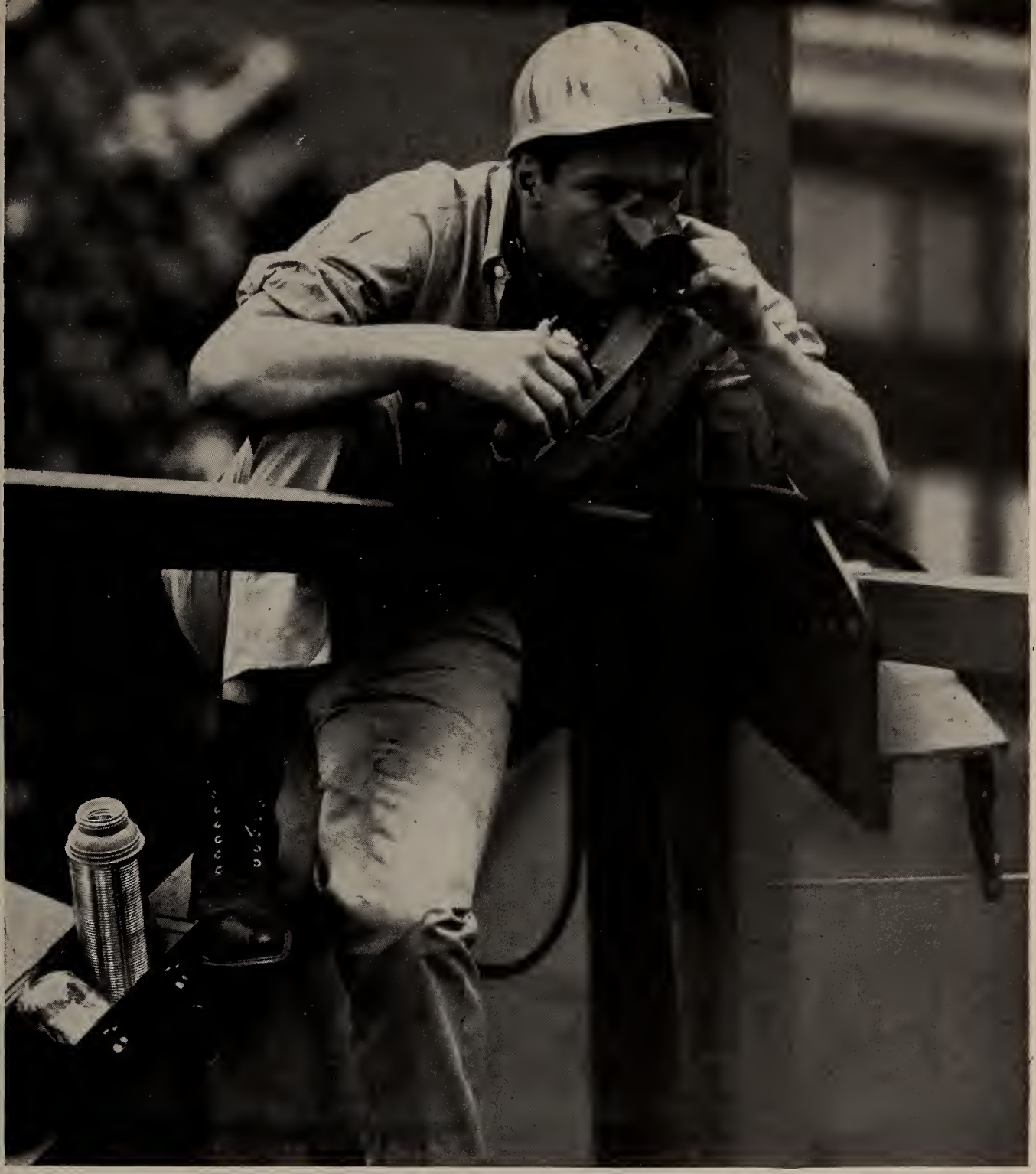
There is nothing to be gained by changing to a lower aspect ratio (for example, from 1.85/1 to 1.75/1) unless lenses of longer focal length be substituted for the lenses presently used. And it goes without saying that a change from good to poor lenses or from coated to uncoated lenses, is a foolish move regardless of aspect ratio. As a rule, however, it may be stated that the performance of projection lenses (contrast, optical resolution, absence of aberrations, and flatness of field) improves as the focal length is made longer.

Neither is there much point in buying the most "rapid" f/1.5 or f/1

(Continued on Page 14)

C'SCOPE PRIME LENS E. F.	LENS E. F. 1.66/1	FOR REGULAR PROJ. 1.375/1 (Conventional)
3.50	2.50 (h—)	3.00 (h—)
3.75	2.50 (h+)	3.00 (h+)
4.00	2.75 (h+)	3.25 (h+)
4.25	3.00 (h—)	3.50 (h+)
4.50	3.25 (h—)	3.75
4.75	3.25 (h+)	4.00
5.00	3.50	4.25
5.25	3.75 (h—)	4.50 (h—)
5.50	3.75 (h+)	4.50
5.75	4.00	4.75
6.00	4.25 (h—)	5.00
6.25	4.25 (h+)	5.25
6.50	4.50	5.50
6.75	4.75 (h—)	5.75
7.0	4.75 (h+)	6.00
7.5	5.25	6.25
8.0	5.50	6.75

TABLE B



"TAKE CHANCES?" "Not I," said the ironworker. "Nor I," added the photographer who made the shot. And right they were—especially the photographer, because with him the pattern of success certainly is "*Take no chances . . . always load with Eastman Film.*" For example, if it's black and white: Load with the new Eastman Double-X. High speed! Fine-grain characteristics! Added depth! Excellent resolution! Plus the advice and cooperation of the Eastman Technical Service. For more information, write Motion Picture Film Dept.,

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Or—for the purchase of film: **W. J. German, Inc.** Agents for the sale and distribution of Eastman Professional Films for motion pictures and television, Fort Lee, N. J., Chicago, Ill., Hollywood, Calif.

An "Audience-Participation" Theatre: The Evolution of the Williamsburg System

By ARTHUR L. SMITH

The following, the first of two articles on the planning and construction of the twin motion picture theatre at Colonial Williamsburg and the presentation of a historical film produced specially by Paramount Pictures, appeared originally in the Journal of the Society of Motion Picture and Television Engineers. The Editors of International Projectionist gratefully thank SMPTE for permission to reprint the Williamsburg Story written by Arthur L. Smith, Williamsburg audio-visual director, and architect Ben Schlanger of New York. In this first article on the planning for the film presentation, Mr. Smith is the author.

Since its opening early in 1957, over 2 million persons have attended Colonial Williamsburg's unique montionpicture theater. They have seen a film in VistaVision with Todd-AO sound. They have seen a dramatic historical film produced by the finest talent of Paramount Pictures Corp. and skillfully directed by George Seaton.

These visitors have had the choice of two showtimes provided by identical theaters showing the film on staggered schedules from a single projection booth. This modern projection booth has been visited by many SMPTE members.

Many are familiar with Colonial Williamsburg and know it as the restored eighteenth-century capital of the Virginia colony. An important, though never very large city, Williamsburg at is peak of historical significance contained about two hundred buildings. In 1780, near the end of the Revolutionary War, the capital of the new Commonwealth of Virginia was moved to Richmond and, thereafter, for about 150 years, Williamsburg virtually stood still. In 1926 nearly 70 of the original buildings remained. The Rev. W. A. R. Goodwin, rector of Williamsburg's Bruton Parish church, was well aware of the historical significance of Williamsburg and he succeeded in interesting John D. Rockefeller, Jr., in what was to result in almost a complete restoration of the city. With great accuracy a center of American history has been re-created and year by year it assumes an increasing importance as a place where visitors can have a visual and spiritual glimpse of the roots of our democracy.

Along with the physical restoration of Williamsburg came the problem of its educational interpretation. A nonprofit controlling organization called Colonial Williamsburg commenced the serious task of exhibiting key buildings and shops. Costumed guides, carefully trained, provided an oral explanation. In 1948 a temporary information center was constructed. A constantly repeating program of slides and films was used to orient visitors and augment the guide service. After



Image on the screen of Colonial Williamsburg Theater. Normally the seats would not be illuminated when the picture is playing.

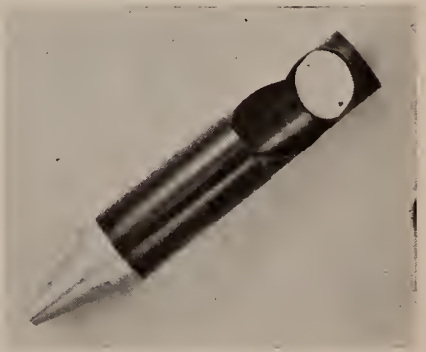
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several years of operation, the great value of this type of orientation was clearly demonstrated and plans were sought for a permanent information center, and an improved program.

The committee, faced with the challenging task of improving the interpretative program, was charged with the responsibility of determining the most imaginative method which would be practical to operate. Almost every conceivable possibility was explored. Wide consultation provided a fund of ideas to be investigated.

In the course of events, a definition of the problem was agreed upon. The purpose of the new program was "to orient the visitor in terms of **historical background** and **mood.**" The wood "mood" is responsible more than anything else for the final plans. At an early stage of the project a suggestion had been made to utilize a series of connecting rooms, with varying audio-visual shows, as a kind of historical **decompression** chamber. For various reasons this procedure was not practical. But it did serve to emphasize the need to take the audience back in **time.** How could an audience be given such an illusion? It seemed evident that some type of motion-picture experience might be the answer.

At this point, Max Abramovitz, architectural consultant for the project, recommended that Ben Schlanger, well-known theater architect, be consulted. This began a very happy relationship. For many years, Schlanger had been advocating an improved screen ratio, increased resolution by greater film area, brighter pictures on unmasked screens, and theater designs which were devoid of architectural decorations. This type of thinking was ideally suited to the Williamsburg project.

It was agreed that a wide-screen participation type of show was the best solution.

After considerable search for a suitable large-film process, the final decision was made easier by an offer on the part of Paramount Pictures Corp. to collaborate on a production using their VistaVision process. Todd-AO agreed to supply six-track stereophonic sound.

With the film medium determined, architect Ben Schlanger continued his research and soon he boldly suggested that Colonial Williamsburg construct two theaters. This proposal was made on two bases: (1) since the length of the film was to be 40 minutes; two theaters operated on a staggered schedule would reduce the maximum waiting time to 20 minutes; and (2) only the "cream" of the participation area in front of the large screen would need to be used for viewing.

Using a picture width of 52 ft (by 26 ft. high) the seating was limited to eight rows of thirty seats each.

Architectural details of the Williamsburg theaters are given by Schlanger in the following paper. Nevertheless, it would be impossible to continue the non-architectural description of this Williamsburg project without reference to Schlanger's contributions in many areas. It was Schlanger who from the outset insisted that, properly, the conception of a film, its production and its exhibition are all one continuous and related process.

Investigations in the area of wide-screen participation viewing and listening were extremely thorough and detailed. They ranged from the psychological implications of audience involvement through optics and acoustics, to the finer points of stereophony. The acknowledgements at the end of this paper give only the general idea of the wealth of important contributions to the technical thinking of the Williamsburg project.

With the general concept of twin theaters accepted, the next step was to determine the technical and artistic nature of the production to be exhibited. In consideration of the wide-screen image, all of the pros and cons of peripheral impressions were examined with care. One of the conclusions was a recommendation that a single lens and no close-ups be employed in the photography. (As a matter of record, the majority of scenes in the final film were taken within a very short range of lenses and there were no real close-ups). The changing nature of perspective where the focal length of taking lenses varied widely was felt to be undersirable and unnatural. Duplication of natural vision was to be desided.

Some of the most fascinating planning sessions took place when stereophonic sound was discussed. For instance, a serious attempt was made to find a workable means of recording location sound stereophonically; it was finally decided that with normal screen action and editing it was impractical to record multiple-channel location sound. A technique of "swinging" sound from voice and effects tracks was later employed in mixing the sound. Music, of course, was truly stereophonic.

A proposal was seriously considered whereby a "presence" track would activate the entire seating area of a floating auditorium by means of converting audio energy to mechanical energy, feeding hydraulic springs. The idea was abandonded, not for lack of courage, but because it was felt that the effect would be distracting in terms of audience awareness.

Acoustics, Horn Placement

The number and placement of horns to secure the effective distribution of sound was the subject of many planning sessions. The possibilities of left and right off-screen speakers, rear speakers, floor speakers and ceiling speakers were explored. Full sound awareness via a complete perimeter of electrostatic speakers was reluctantly abandoned when the sound quality of such speakers was studied.

With six tracks available, the final decision sent five of these to behind-the-screen speakers while the sixth fed a nest of six distributed ceiling speakers.

It was felt that the theater should be acoustically dead, making possible good exterior sound scenes. A well-known authority on acoustics, Leo Beranek explains this as follows: "The reason that the theater should be acoustically dead is that the illusion of creating outdoor conditions cannot be achieved where there is any reverberation or echo. When one walks outdoors, sounds that are generated travel directly to the listener unenhanced by room reflections. Thus, man has associated a feeling of openness with lack of reverberation. It is easy, however, to introduce reverberation into the soundtrack for those cases where specific room room effects are desired. Another reason for introducing room effects into sound channels is the great variety of room conditions that Colonial Williamsburg might wish to depict in the film. These conditions would range from the revererant acoustics of the House of Burgesses down to the nonreverberant conditions of a small bedchamber."

As constructed, the Williamsburg twin theaters have reverberation time in the midfrequency range of 0.6 sec while in the high and low ranges this figure is slightly less. All floor areas are heavily carpeted.

Film Selection, Development

Development of a script was first commissioned by Paramount to the late James Agee who completed most of a treatment prior to his death. This last work of



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Agee was a document of great value and sensitivity—but because further detailing was needed, this work was postponed for later sympathetic completion.

The story of the film covers the years immediately preceding the American Revolution and in so doing vividly people the Williamsburg set in such a manner that visitors, having seen the film, may imagine that they walk the streets of the old city and visit the buildings.

Due to the intimacy of the theater, the amount of camera movement was extremely limited and the screen figures were kept low in composition wherever possible. A six foot model of the theaters was demonstrated to the production crew before filming commenced so that the later visual effect of the screen would be realized. The large screen so close to the audience is a definite restriction as far as conventional photography is concerned. (This is an increasing problem as screens in theaters grow larger.)

The Paramount crew shot the film entirely on location in Williamsburg and on surrounding plantations. Extremely difficult interiors were actually filmed in the historic rooms, many of them small in size, and all of them small in terms of the usual set. Since the story concerned the years just prior to the American Revolution, the film was a costume piece. Every detail was handled with the greatest possible authenticity. Actors who played Washington, Jefferson, Patrick Henry, George Wythe and other historic characters were carefully selected for physical resemblances and also for voices to the extent we know about them.

The film, shot with Eastman color negative on double-frame Vistavision, is projected with the maximum possible lateral aperature. A small amount of top and bottom picture is lost to sound striping. A diagram of the film dimensions is shown in the succeeding paper.

Altec, Century Equipment

During production of the film, the construction of the theater was proceeding. Altec Lansing Corp. supplied the principal electronic work; Century Projector Co. manufactured the projectors.

The twin theaters are a part of the Information Center building. A common projection booth serving both theaters is located over the main information and exhibition lobby. The audience enters the theater on one side and departs on the other. No center aisles are required but comfortable walking room is allowed by spacing rows of seats four feet apart. Persons in one row do not see those in other rows in front of them.

In order to achieve good visibility, yet prevent excessive keystoning, a stadium type of row elevation has been employed. Projection angle is about 4 degrees.

Schlanger's theory that a motion-picture theater should be a neutral viewing has been carried out completely in the new Williamsburg theaters. His desire to use a maskless screen and a blended lateral image required considerable technical investigation. The detailed description of the screen is given in the succeeding paper.

The projection booth has been regarded by projection specialists as an accomplishment of some merit. Although the fundamental layout, as shown in the following paper, was designed by Mr. Schlanger and the author, it represents, as is the case of the other areas, the design talents of many people.

The booth is serviced under a contract which includes the care of the mechancal functions and is perhaps unusual in this respect.

The day-to-day operation of this booth has been extremely satisfactory during the years of its operation. Only normal problems of wear and failure have been encountered though it is true that many of the special innovations required careful adjustment until operational experience was gained. Operators find the area pleasant, roomy and quiet.

The author gratefully acknowledges the assistance given at all stages of planning construction. Among those who have made important contributions to the success of the project are the following: Brian O'Brien, American Optical Co.; Douglas Shearer, Metro-Goldwyn-Mayer; Walter R. Hicks, Reevesound Co.; Loren L. Ryder, Ryder Sound Services, Inc.; Charles R. Daily, then of Paramount Pictures Corp. and now of Hughes Aircraft Co.; Frank LeGrande, Paramount Pictures Corp.; Fred Hynes, Todd-AO; Edward S. Seeley, Altec Lansing Corp.; C. S. Perkins, Altec Lansing Corp.; Dave Demarest, Altec Lansing Corp.; Leo Beranek, Bolt, Beranek and Newman Inc.; Ernest Wolf, Wellesley College; W. J. Crozier, Harvard University; Larry Davis, Century Projector Co.; W. Ferguson, New York University; C. S. Ashcraft, C. S. Ashcraft Mfg. Company, Inc.; Willard Yoder, W. A. Yoder Co.; Daniel J. Bloomberg, Republic Studios; John Selby, Selby Industries, Inc.; Leonard Satz, Technikote Corp.; F. B. Hutchinson, Perkin-Elmer Corp. **iP**

Next Issue:

Ben Schlanger, architect for the Williamsburg Theatre which incorporates many revolutionary ideas in the proper design of a theatre for best motion picture presentation, will discuss the theatre's motion picture system — "from camera to viewer". Watch for these design features:

Entrance area is a "light lock"

Floor-to-ceiling projection area — 120-ft. screens

Design of viewing spaces

Projection room 50 by 50 feet

Automatic lighting and master projection control

HiFi "Home Stereo" Poses Sound Showmanship Problem

BY FRANK E. CAHILL, JR.
Vice President
Century Projector Corp.

Many people are saying that HiFi stero sound quality in the home is superior to theatre sound presentation —Intelligent and box-officewise exhibitors and projectionists know this to be a fact.

Too many exhibitors, producers and distributors attempt to camouflage the issue by deliberate ridicule. They say the public does not know the difference.

Containment can be dangerous— in this case it is downgrading America's medium of entertainment. If the motion picture theatre is to compete with the home, the producers and distributors must face the issue realistically and provide multi-channel stereo prints.

Multi-channel stereo projection equipment is available; Stereophonic or HiFi presentation is the answer.

To substantiate the justifiable criticism being focused on theatre sound presentation, actual references are being made to the current release of print-down 35mm versions of 70mm spectacles. These 35mm versions are reportedly being released in single channel optical sound only.

The tremendous impact of stereo is completely lost and the once multi-million dollar spectacle is now just another picture.

There is no objection to 35mm prints but there is a decided objection to the missing impact of multi-channel stereo sound presentation.

Window dressing with popcorn may be pretty, but nothing can replace showmanship in sound presentation.

iP

National Cine Equipment Acquires Wall Camera

NEW YORK — National Cine Equipment, Inc., 209 W. 48th St., designers and manufacturers of professional equipment for making 35mm and 16mm TV and motion picture films, has announced that it has acquired the John M. Wall Co., manufacturers of the professional "Wall Camera," known throughout the world since 1929.

The John M. Wall Co. also built the equipment for Cinerama. John Clemens, president of National Cine, says "the firm will continue to manufacture the same fine products."

iP

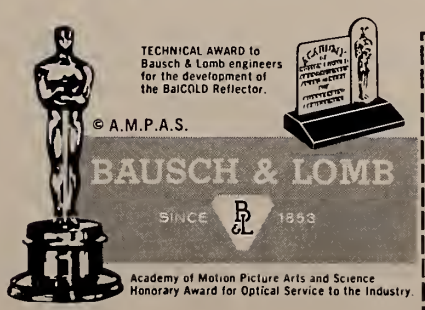
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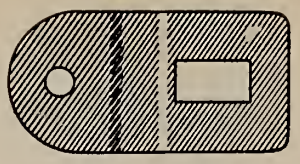
projection lenses when the arc lamps are antique models having an optical speed of f/2.3 or f/2.5. Actually, the slower f/1.9 and f/2.3 lenses are easier to design for top-notch results; and they also have the greater "depth of focus" which better tolerates film buckle.

This does not mean that old-style lenses are always better than the newest ones: quite the contrary, modern lenses are generally better than the older ones, particularly in the shorter focal lengths and higher optical speeds. Nevertheless, theatre management should insist upon a period of free trial before the purchase of new lenses is consummated.

One important caution must be mentioned. Old lenses which were no good even when they were new should not be put back into service. Old lenses which are scratched or "frosted" from overcleaning should not be used. And neither should uncoated lenses be used. The optical value of antireflection coatings is inestimable — brighter, clearer pictures having maximum contrast.

Every uncoated projection lens now in use should, therefore, be replaced without delay — and we're not kidding! Even the most thrift-conscious exhibitor will be pleased with the improvement in the appearance of the pictures, and so will his patrons. Practising projectionists know better than most theatre managers that any "brightening" of the projection creates a favorable glow which extends well into the boxoffice.

This writer hesitates to belabor the point that picture-distorting curved screens are now tabu, and should be replaced, wherever found, with seamless flat screens, either brilliant matte white or super-bright pearl. Lenticulated pearl screens offer special advantages; but this is a matter which can be discussed another time. Undeniably, the use of the 1.75/1 aspect ratio in place of the excessively high 2/1 and 1.75/1 ratios for regular non-anamorphic projection is a step in the right direction toward restoring projection quality to the high level which was commonplace in the days before the wide screen became standard practice. **iP**



1.85/1 Aperture



1.75/1 Aperture



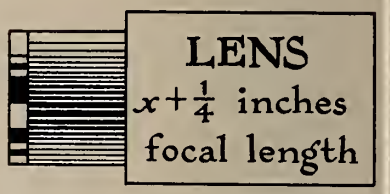


FIG. 2 — When changing aperture plates to reduce the aspect ratio of the projected pictures from 1.85/1 to 1.75/1, the lenses must also be changed to gain the advantages of clearer, steadier, brighter pictures. The old lenses are replaced by new ones one-quarter inch longer in focal length (E.F.). If this be done, the original height of screen image will be maintained, while more of the film frame (top and bottom) is included in the picture.

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PROJECTIONIST'S WIFE STRICKEN

EVANSVILLE, IND. — Ida M. (Billie) Burlison, wife of Brother Paul V. Burlison, Treasurer of Local 367 M.P.O., suffered a heart attack Nov. 23 while the couple were celebrating their 36th wedding anniversary. She was taken to St. Mary's Hospital in Evansville, where her condition was listed as serious for several days. At this writing, she is showing some improvement and friends are visiting her at the hospital. **iP**

PROJECTION PERSONALITY:

Jack F. Rollman Wants the Projectionist To Know the Equipment; He Teaches 'Em

Fortunate is the younger projectionist who gets a job working for Jack F. Rollman, head projectionist at the Rivoli theatre in New York, for Jack believes in showing all of his know-how about the machines in his booth to operators under his supervision.

"It's not only good for consistent screen presentations for customers of the theatre, but it's also good for the chief not to be called on for details of how the equipment functions when some unusual thing occurs," he says.

Even a casual acquaintance would know that Rollman would be more patient and gentle in his instructions about the equipment than the stern, severe and austere training he got working as a repairman for George Meyer, who had a projector repair shop on Third Avenue in the '20's.

Meyer was a memorable character, not only as a respected expert on projectors but a personality as well. Rollman recalls that when Meyer came into a booth to fix a machine, he first inquired if the booth included a spittoon, and if it didn't he would not work until a receptacle was placed nearby to receive tobacco juice from the cud in his mouth. He also recalls Meyer's freedom with cuffs and boots when his shop repairmen did something wrong.

Rollman, a projectionist since 1925, has been chief projectionist at the Rivoli since 1953. Two years later the Rivoli was picked as the first theatre to project pictures in the Todd-AO process. Incidentally he suggested a minor but important alteration on the Norelco 70-35mm projector, when "Oklahoma" ran at the Rivoli and which has been carried out on those projectors ever since.

Jack started as a rewind boy in a theatre in the Bronx. He took the temporary job when a high school buddy induced him to fill in for him when he wanted to take a few days off. Rollman liked the work and took a course in Joe Taylor's motion picture operators school. His choice of a career displeased his grandfather, who had brought him up. The grandfather was a wealthy realtor and thought his grandson had picked "a hell of a trade" to make his life's work.

When the Rivoli installed the Norelco 70-35mm projectors they built a booth on the mezzanine floor for a showroom, and installed the Norelco machines also in the upper booth. After several rehearsals of "Oklahoma" in Todd-AO from the upper booth, it was decided that the pitch from the upper booth did not give as satisfactory presentation as the lower booth, and thereafter the mezzanine booth has been used.

Since the mezzanine booth has a foyer leading into the projection room, Rollman keeps the door open for visiting projectionists who can walk in to see the equipment with Jack explaining how the machines work. "I feel," he says, "that projectionists who are interested in new equipment should see and learn about our booth setup."

When Mike Todd had the world premiere of his "Around the World in 80 Days" at the Rivoli, he told Rollman and his projection crew that "you can make me or break me." After the first performance Todd warmly congratulated and thanked the projectionists.

"Around the World in 80 Days" ran for three years on Broadway at the Rivoli, with one print running through the projectors for 786 times.

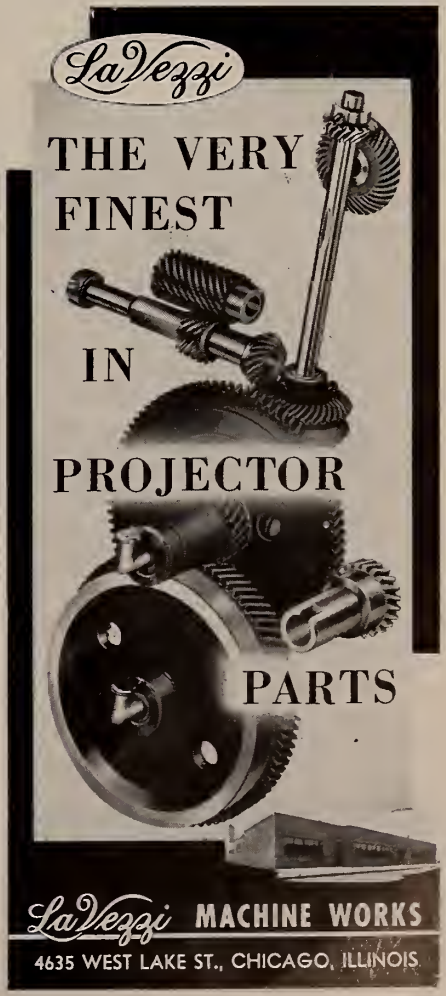
Jack Rollman is a member of the SMPTE Film Projection Practice Committee, which adds to his busy schedule. He has proposed that the Committee should set up standards for the one-half inch shaft in the magazines of standard 35mm projectors. "That shaft," he says, "is responsible for much of the print damage, for if it doesn't function properly, if it wobbles, it can do he is finicky about film tension in the projectors and the strictest attention to that detail at the Rivoli is constant.

Jack Rollman never worked as a projectionist outside New York City. Among his earlier days he was an operator at the Bronx Opera House, a combination vaudeville and film show house. It was a tryout for vaudville acts, and Jackie Gleason and Red Skelton first tried out their acts there. Rollman recalled that Skelton used to come up to the booth and wanted to run the machines.



Jack Rollman

Jack, now 53, was born and reared in the Bronx. He's a member of IATSE Local 306 and a member of the Twenty-Five-Thirty Club. **iP**





Architect's sketch of the above-ground view of the entrance to the proposed new 400-seat underground art film theatre in the University section of New Orleans.

New Orleans Theatre Goes Underground for Novelty Plus Quality of Presentation

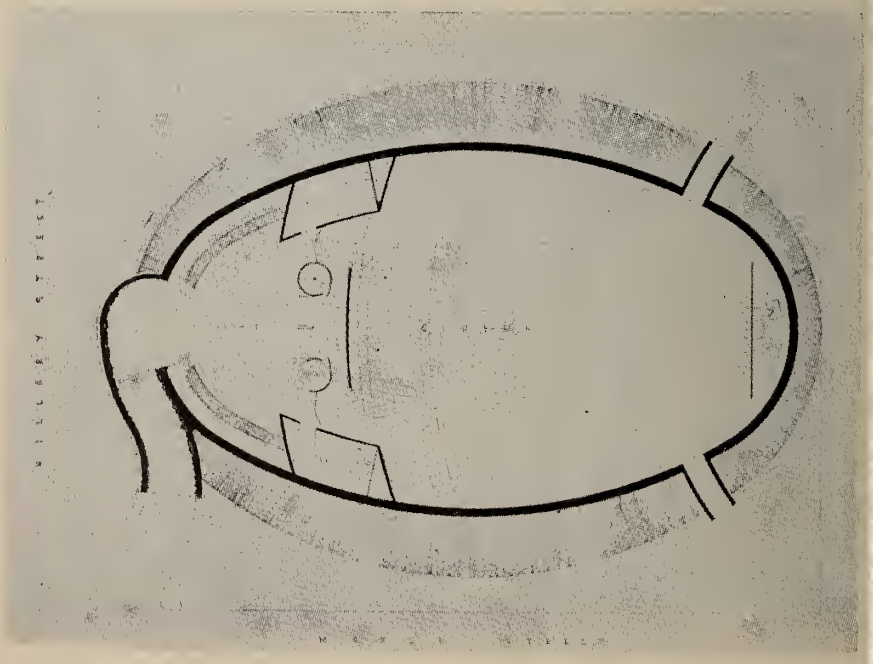
NEW ORLEANS — Initial plans for construction of a new art film theatre in the University section of New Orleans were announced today by Robert Rowen, president of The University Cinema, Inc.

Rowen said the projected theatre will be the first new film theatre in the New Orleans area in the last ten years, and will be the only theatre in the city specially designed and built for the art film trade.

Present plans call for the theatre, to be located at Maple and Hillary streets, to be sunk below the ground, leaving the entire lot surface free for automobile parking.

Rowen, who heads a group of New Orleans citizens that has spent eighteen months studying and planning the project, will also act as manager of the new theatre. He said a basic film policy of first-run foreign and domestic films will be coordinated with carefully selected re-releases.

The underground auditorium is an entirely new concept in American theatre construction and will

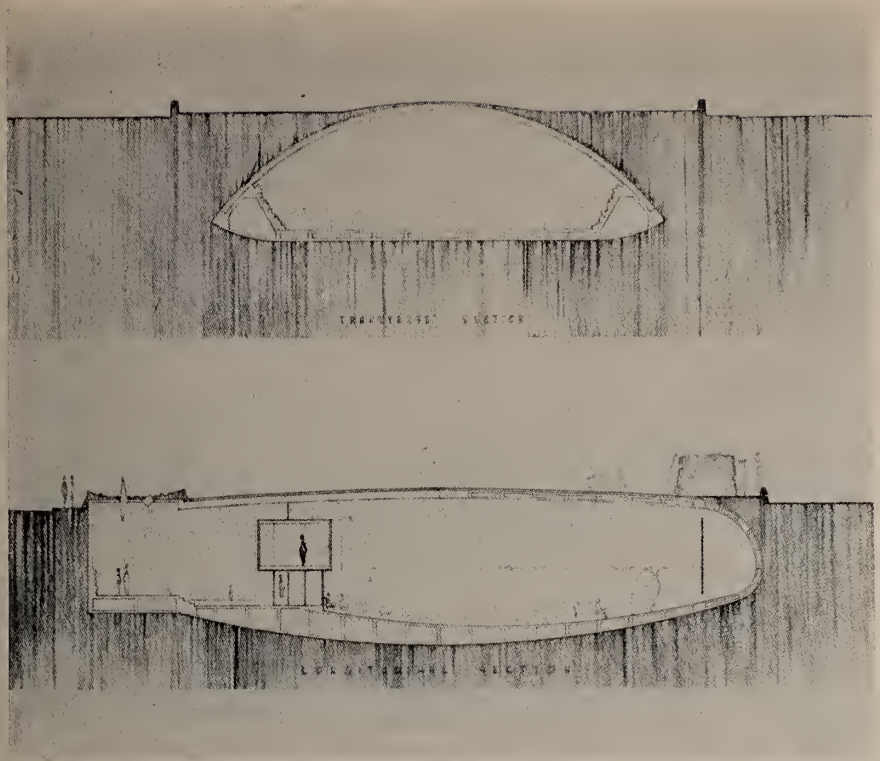


The architect's conception of what the underground theatre would look like with its dome roof removed. Ground level of theatre would be used for parking.

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Underground cutaway-profile view of the theatre showing (top) the auditorium looking from the back toward the screen, and (bottom) the side profile view.

be the only underground theatre in the United States. Its 400 Heywood-Wakefield deluxe push-back seats and scientifically designed curving interior surfaces will provide the maximum comfort and best possible reproduction of artificial sight and sound.

Designed by architects E. E. McNaughton, Earl M. Stahl and Richard Hunter, in cooperation with consulting engineer Bill Mouton, the building will embody many entirely new concepts of structural design to achieve strength and beauty through a harmony of materials, form and design.

The entrance and ticket counter will be located on the downtown-lakeside corner of the lot with an entrance ramp curving gently down to an entrance foyer some 10 feet below the street level. Only the dramatic entrance-way and a faint outline of the domed auditorium will project above the ground.

From the entrance foyer an auditorium of a modified egg-shape design will descend to a depth of 24 feet below street level at the lowest point. A double wall of pre-stressed concrete, plus waterproofing and pumps will compensate for the New Orleans water table.

Rowen said the entire project was undertaken with the aim of bringing together quality films and luxury surroundings in a location convenient to the largest possible number of theatre-goers. Its location with walking distance of the Tulane and Loyola university complex and Dominican college will provide students with quality entertainment at reasonable cost and maximum convenience.

Rowen said a public opening is planned for the early fall of '62.

iP

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Eprad Buys New Transistor Sound System

MINNEAPOLIS — The transistor sound system developed by Minneapolis Theatre Supply and Northwest Sound Service has been sold to Eprad, Inc., Toledo, Ohio, according to a recent announcement. Minneapolis Theatre Supply is operated by Charles Creamer, Bob Lindquist and Bob Lahti, who developed the complete system prior to its installation in local theatres in conjunction with O. Earl Maxwell of Northwest Sound Service.

The purchase by Al Boudouris includes the design and equipment on hand. Two of the units will shortly be installed in New York City; both the Cinerama Theatre and the Mann Theatre here were supplied with the transistorized system at the time of their remodeling, although the Cinerama installation has since been moved to Detroit.

Eprad—Electrical Products Research & Development Co.—is a prominent manufacturer of drive-in speakers, car counters, car heaters, electrical and electronic equipment for government use and radio broadcasting equipment.

iP

Projectionist's Job Develops By Challenges

Some clarification may be useful regarding reference in the profile on Morris Klapholz which appeared on page 7 of this journal's September issue.

Klapholz was quoted as saying that "now the best new projectionists are those who have jobs outside the big cities."

His remarks on that point were foreshortened in the article and may

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not have conveyed completely Klapholz' thoughts. The point he was driving at was the big city theatre's ready facilities for parts that suddenly break down. Night and day some city theatres and their projectionists have access to repair shops, equipment dealers and service firms whereby supplies and a mechanic to install them can be delivered in a matter of thirty minutes or so and without interruption to the show.

Several showcases in the big cities have four projectors, so if one of them acts up there's always a spare machine the operator can rely on without a breakdown in continued operation. Big city theatres, mostly, don't have a spare intermittent unit—there's always a repair shop, dealer or service firm on call to rush such a part to the booth with a mechanic taking out the broken down unit and installing the replacement.

On the other hand, the small out-of-town theatre operator, "new" as well as the veteran, keeps his hand in for changing from the faulty to the new spare part, which is in his booth, into the projector. He can change the intermittent in about ten minutes. So can the big city operator. But the difference is that most of the younger big city projectionists don't have to monkey with a faulty machine or put in a tube in the rectifier or sound system, whereas most of the out-of-town operators, remote from the repair shops, service firms or supply dealers, have no one to rely on but themselves — in other words his mechanical skill in repairs is tested more often than most of his big city fellow projectionists.

According to the old saw, necessity is the mother of invention, and this holds good for craftsmen or scientists, merchants, engineers and people in all walks of life. That's why veteran projectionists who had to tackle new developments — refinements in projectors, sound and the modern marvels of screen presentation equipment — are relied on by the inventors, engineers and theatre equipment manufacturers to make suggestions in the practical application of their idea or new machines.

They have the practical knowledge of the needs of the theatre, and got that by fussing with new machines and sound systems which had bugs in them at a time when there wasn't much know-how about the new machine or system by the dealer or serviceman.

To some extent the younger out-of-town operator has to fuss with balky equipment because there's no quick help from outside service men, which means the necessity is there to challenge his mechanical skill and, so to say, invention.

So that, we think, was the point that Morris Klapholz made. The idea was certainly not to say that all out-of-town "new" projectionists are better than their big city brothers — only the conditions under which they work are more conducive to developing their mechanical skills. **iP**

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

MEANS AT HAND — INDUSTRY LAG

When one looks over the movie industry today, with its most severe competition from HiFi addicts and television fans, a depressing thought comes to anyone who has a deep affection for the so-called art-industry.

The film industry has the means to get the HiFi and TV fans away from their phonographs and TV receivers for a respite from their familiar surroundings (the old saw, "familiarity breeds contempt" still holds good, even when the home is comfortable and beautifully furnished according to the taste of its occupants.)

The means for more moviegoing is now being neglected by the industry — specifically the producers-distributors. If the latter would make 70mm prints available to the average theatre there would be more installations of 70-35mm projectors with stereophonic sound systems.

Now the practice is to print down their bigger attractions filmed with 65mm cameras and recorded with stereophonic sound, once their engagements have run out at the key city showcases on a road-show basis.

Too many producers and distributors have the idea that moviegoers don't notice the difference between 70mm and 35mm screen shows. Many progressive theatre owners and projectionists have definite knowledge that the producers-distributors are wrong about this. Some producers and distributors admit that the audience is conscious of the difference between stereophonic and one track sound, but are reluctant to plow profits back for the progress of the industry.

So the vicious circle goes around the industry. Exhibitors who have installed 70-35mm projectors and stereophonic sound complain about the lack of the bigger prints, and this discourages progressive theatre owners who would equip their theatres with 70-35mm projectors if such prints were available to them.

This factor is also discouraging to the theatre equipment manufacturer, who has been a source for improvement of screen presentations, using his costly research to find better means of projection, better screens, sound systems and other refinements for the tools of better screen presentation.

The producers, distributors and theatre owners could make more profit and insure the progress of their industry if the majority of theatres in the world could be equipped with 70mm, stereophonic sound equipment and more frequent prints made available in the bigger film.

And what a joy that would be to the projectionists, many of whom now struggle with worn out equipment, because their bosses, the exhibitors, would have to make the investment to convert their theatre to the new standard or lose their customers to the competition.

Next Month . . .

We will welcome back to the pages of International Projectionist next month an old favorite, Hank Boldizsar of Los Angeles, a member of IA Local 150 and a practicing projectionist, who in the course of his travels may be dropping in on projectionists throughout the West Coast area. It's another move by IP to be sure all news and technical material involving our craft gets a chance to be seen in the only place every projectionist looks — in the pages of IP.

INTERNATIONAL PROJECTIONIST

Volume 37 January, 1962 Number 1

TRANSISTORS:

MIGHTY MITES OF ELECTRONICS

By ROBERT A. MITCHELL

One of the more interesting modern developments contributing to the high quality of motion-picture sound is the "transfer-resistor," better known as the **transistor.** Transistorized amplifiers are being increasingly used to replace old-style tube-type amplifiers. Cinerama and 70-mm projection systems have been among the first to utilize the advantages of the transistor.

Transistorized amplifiers have also proved extremely satisfactory for standard 35-mm optical sound, too. As a matter of fact, the use of transistorized preamplifiers and the new phototransistors raises the quality-level of optical sound above the average quality of CinemaScope magnetic-track sound.

And unlike ordinary electron tubes and photoemissive cells, transistor rectifiers, amplifiers, and "light sensors" are extremely rugged devices which never seem to wear out!

Transistors Advantageous

What are the principal advantages of transistorized amplifiers for both magnetic and optical sound reproduction? Well, they are extremely compact, light-weight, durable, and economical. They eliminate complicated circuitry, expensive power supplies and sound-distorting coupling transformers; and they consume relatively little power and give out very little heat. Unlike a vacuum or gas-filled electron tube, which consumes about 2 watts of heater current, a transistor has no filament, and hence needs no "A" power supply.

Individual transistors cost two or three times as much as the corresponding electron tubes, but they last so long that they eliminate the nuisance of frequent testing and costly tube replacements. Transistors are thus more economical in the long run.

The initial cost of transistor amplifiers is less than that of tube amplifiers because circuitry is simpler and no expensive matching transformers are needed. The absence of transformers also eliminates intermodulation and minimizes other non-linear distortions which ruin the sound in theatres which persist in retaining obsolete tube amplifiers.

Unlike an electron tube, which is a high-impedance device (100,000 to 1,000,000 ohms), transistors have relatively low impedances (25 to 1000 ohms, with 100 ohms input and 750 ohms output being representative). Transistors, therefore, cannot be used as direct substitutions for tubes in older amplifiers, but require a circuitry designed especially for them.

Transistor Principles Long Known

The crystal-and-catswhisker "detector" of old-time radio receivers was actually a transistor! Radio waves generate high-frequency alternating current which must be rectified into direct current before they can be amplified into sound. The rectifier for this purpose — a simple 2-element device called a **diode** — consisted in the earliest days of radio of a crystal of galena (lead sulfide) contacted at a sensitive point on its surface by a "catswhisker" of silver or platinum wire. This device functioned as a detector, or radio-frequency rectifier, by passing current in only one direction.

Crystal sets were the only kind of radio receivers in use until the vacuum-tube detector invented by J. Ambrose Fleming in 1904 became commercially available. There were no amplifier tubes, either — the sound could be heard only in earphones!

Fleming's tube was a simple diode in which electrons thrown off from an incandescent filament (**cathode,** negatively charged) passed through a vacuum to a collecting-plate (**anode,** positively charged). In later years the electron-

tube diode was adapted to efficient low-frequency AC rectification by filling it with an inert gas, such as argon. The argon atoms contribute electrons to the current flow by "secondary emission." The tungar rectifier tube, still used in many theatres as a DC power supply for arc lamps, soundhead exciters, old-style speaker field coils, etc., is a gas-filled diode of this type.

Long before the word "transistor" had been coined, copper oxide, selenium, and silicon power rectifiers were widely used for projection purposes. These, too, are actually transistors of the diode, or 2-element, type arranged in pairs of "stacks" for full-wave rectification of alternating current. The selenium rectifier has all but displaced the motor-generator as power converter for projection arcs.

Crystal-type "detectors" were re-introduced and improved during the second world war to meet the special requirements of radar. Now, radar utilizes radio frequencies of many millions of cycles per second. At these high frequencies the cathode and plate of a vacuum tube exhibit a capacitance that practically short-circuits the tube and prevents it from performing properly. Crystal detectors work much better at ultra-high frequencies than electron tubes do.

Modern Germanium Transistors

Improvement of crystal-type detectors for radar equipment led directly to the invention of the modern transistor which has revolutionized both radio receivers and motion-picture sound systems. In place of the galena crystals of the old-time radio sets, the new detectors developed for radar employed such "semiconductors" as silicon and germanium. These are grayish, crystalline, semi-metallic elements which look like cast iron when fractured. They play the double role of metals and non-metals in their chemical reactions. Germanium, for example, acts as a metal in the salt called germanous chloride, $GeCl_2$, but like a non-metal in germanic chloride, $GeCl_4$, and in a series of salts called "germanates."

The improved crystal-type radar detector consisted of a metallic point pressed upon a block of germanium. This device is strictly analogous to granddad's catswhisker detector. And like the old radio crystal detector, the germanium "contact diode" is a transistor.

The current-rectifying action of a crystal detector or a contact transistor has been well explained by complex electronic theories. It suffices to say here only that the high-resistance contact made by the metallic point (**emitter**) on the block of semiconducting gremanium (**base**) somehow allows the current to flow in one direction, but not in the other (unless the device be overloaded). **Current is allowed to pass from the germanium base to the catswhisker emitter, never in the reverse direction.**

A more modern type of transistor is the junction type, which is the kind used in amplifiers. The catswhisker contact type is confined to radar apparatus.

Diodes are Rectifiers

Figure 1 reveals how a diode transistor (either contact or junction type) compares with a diode electron tube in terms of conventional electrical symbols. Keep in mind that the electrons pass through the tube from the filament-heated cathode to the plate, never in the reverse direction. Alternating current applied to the tube is "rectified" to pulsating direct current simply because the current can flow through the tube only one way.

So also with the transistor: the electrons can flow in only one direction, that is, from the base to the emitter. This is exactly opposite to the direction indicated by the arrowhead symbol for the emitter! Electrical circuits are conventionally traced from positive to negative even though electricity

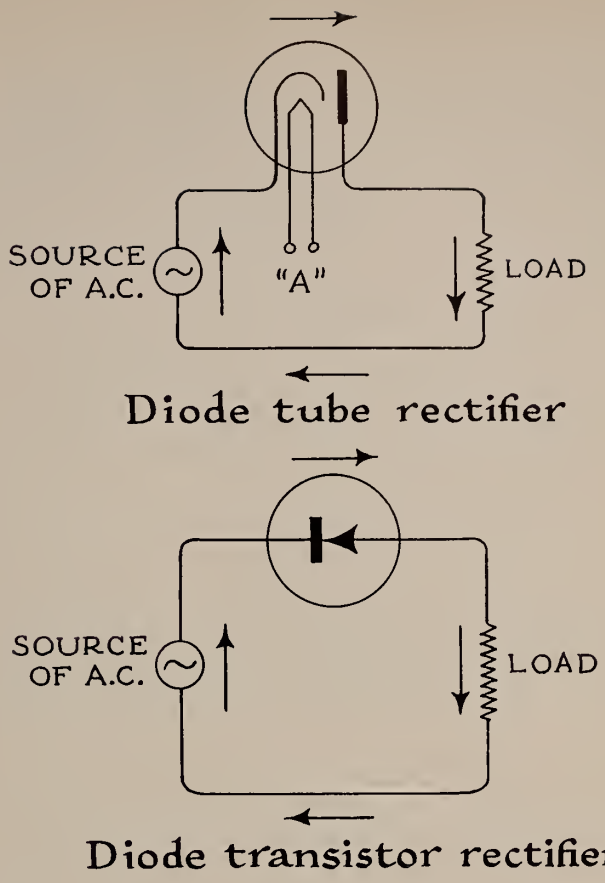


FIG. 1 — Comparison of simple electron-tube and transistor rectifier circuits for converting AC to DC. Because each circuit employs only one "diode" to pass the current in one direction, each is a "half-wave" rectifier. The tube circuit requires an external power supply to heat the filament, and also a somewhat higher load impedance than the transistor circuit.

actually flows from negative to positive, as the behavior of electron tubes proves.

The diode transistor thus rectifies AC into pulsating DC exactly as a diode electron tube does. But unlike the tube, the transistor has no filament, and hence needs no supply of "A" current to heat the cathode. This is why a transistorized radio starts playing the instant it is switched on — it has no tubes, no current-wasting filaments, and thus requires no "warmup time."

The two half-wave rectifier circuits shown in Fig. 1 are identical in function even though tubes cannot be replaced by transistors without making certain circuit changes. In order to obtain maximum power transfer, the load resistance must match the internal impedance of the tube in the one case, and the resistance of the transistor in the other. Electron tubes have high plate impedances whereas transistors have relatively low resistances.

Triodes are Amplifiers

Fleming's diode tube could rectify but not amplify. In order to construct a tube capable of amplifying feeble audio currents, the flow of strong direct current through the diode had to be controlled by weak sound currents. In 1906 Dr. Lee DeForest, a pioneer radio inventor, discovered a way to do this. He placed a wire-mesh "grid" as a third element between the electron-emitting cathode and the electron-

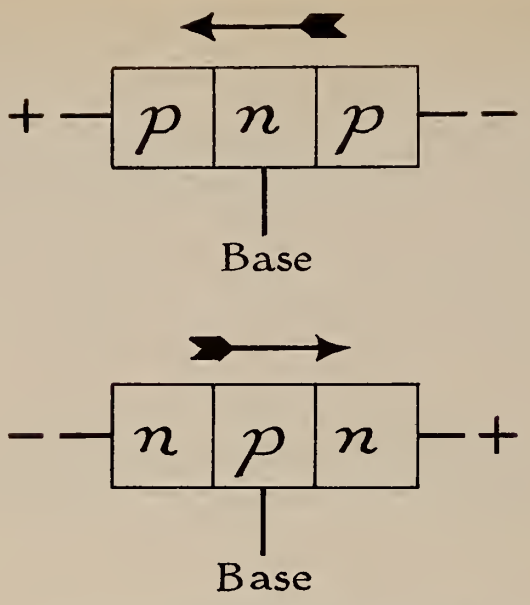


FIG. 2 — The two complementary types of triode junction transistors used in amplifiers. Current can flow only from the n-type material (negative) to the p-type (positive). Certain circuits can be greatly simplified by the use of both p-n-p and n-p-n transistors in the same device.

attracting plate of Fleming's diode. A 3-element tube is called a **triode.**

By placing a small negative charge on the grid of his new triode by means of suitable "grid-bias" voltage, DeForest was able to reduce, or even stop, the flow of electrons through the tube. Then, by adding a weak audio current to the carefully adjusted grid bias current, he discovered that the tiny fluctuations in the negative charge of the control grid produced proportionately great fluctuations in the flow of the powerful plate current. Because his triode was thus able to "amplify" audio currents, DeForest called it an "audion tube," a name which has passed out of use. It was this important discovery that made loudspeaker radio sets, electric phonographs, and sound movies possible.

The first important breakthrough in transistor research came in 1948 with the discovery by John Bardeen and Walter Brattain of the Bell Telephone Laboratories that a second point-contact placed very close to the first on the germanium base of a contact transistor functioned like the grid of DeForest's 3-element electron tube. That is to say, very weak currents in the sceond "catswhisker" controlled the flow of a relatively strong bias current in the first "catswhisker"! Thus was born the triode contact transistor capable of amplifying audio currents in the manner of an electron tube having a control grid positioned between the filament-heated cathode and the plate.

The contact type of triode transistor was never widely used. In addition to manufacturing difficulties which prevented consistent quality of the product, the small area of the catswhisker point-contacts severely limits the amount of current that contact transistors can handle.

Junction Transistors

The second important development in transistors took the form of a scientific theory proposed in 1949 by William Shockley, also of the Bell Telephone Laboratories. Shockley's remarkable theory explained the action of transistors in terms of crystal structure, electrons, and positive charges, and revealed the possibility of making a more efficient type of transistor by welding together thin blocks of germanium containing special impurities capable of either giving up electrons to the germanium or of taking electrons from it. This, the modern "junction transistor," was actually **predicted** by Shockley before anybody had made one.

When voltage is impressed across a piece of pure germanium, electrons flow through it in one direction and **an equal number** of positive charges ("holes") flow in the opposite direction. The production of the so-called holes is believed to be caused by the crystalline structure of the semiconductor.

By adding to pure germanium a small amount of an "electron donor," such as arsenic or antimony, the number of mobile electrons becomes greater than the number of positive holes. The germanium is then said to be a negative, or n-type, semiconductor. Conversely, the addition of an "electron acceptor," such as indium or boron, increases the number of holes over the number of mobile electrons. In this case, the germanium is called a positive, or p-type, semiconductor. **Modern junction transistors consist of layers of n-type and p-type germanium or silicon welded together.**

A diode junction transistor accordingly consists of a piece of p-semiconductor fused to a piece of n-semiconductor. This is designated as a p-n transistor. Either side may be regarded as the "base" or the "emitter"; but the current always flows from the n-semiconductor, through the junction, to the p-semiconductor.

The selenium arc-lamp rectifier is essentially a diode junction transistor. Each transistor unit of the "stack" consists of a metal plate coated with a thin layer of selenium, a semiconductor. Over the selenium is sprayed an alloy coat. Rectification takes place between the selenium and the outer alloy layer. The direction of current flow is from the selenium to the alloy.

Modus of the Germanium Triode

If a germanium junction transistor is made up of three layers (the middle layer of the "sandwich" being very thin for high efficiency), the result is a junction triode which is able to function exactly like a triode electron tube having a control grid between cathode and plate. But unlike a triode tube, triode transistors exist in two complementary forms, depending on whether the semiconductor layers are arranged in the order p-n-p or n-p-n (Fig. 2). Both types are widely used, sometimes in the same amplifier to simplify the circuitry.

The conventional symbols for triode electron tubes and transistors are given in Fig. 3. Note that the transistors may be of either p-n-p or n-p-n type, depending upon the arrangement of the layers and the direction of the current flowing through them. In the tube, however, current can only flow from the cathode through the grid to the plate. The cathode is also the "common element" for the grid (input) and plate (output) circuits.

In the transistor, either the base or the emitter may be connected as the common element shared by the input and output circuits. If the base (middle layer) be used as the common element, the emitter functions like the grid of an electron tube, and the collector functions as the plate. Contrariwise, if the emitter be the common element, then the base acts as the grid, and the collector as the plate, as before. There is this difference, however. If the transistor be of the n-p-n type, the current flows in the reverse direction, that is, from the "plate," or collector, to the base or to the emitter, depending on how the transistor is connected!

The choice of connections for a triode transistor depends on the input and output impedances desired. The output impedance is about 10 times lower when the transistor is common-emitter connected. The input impedance is lower

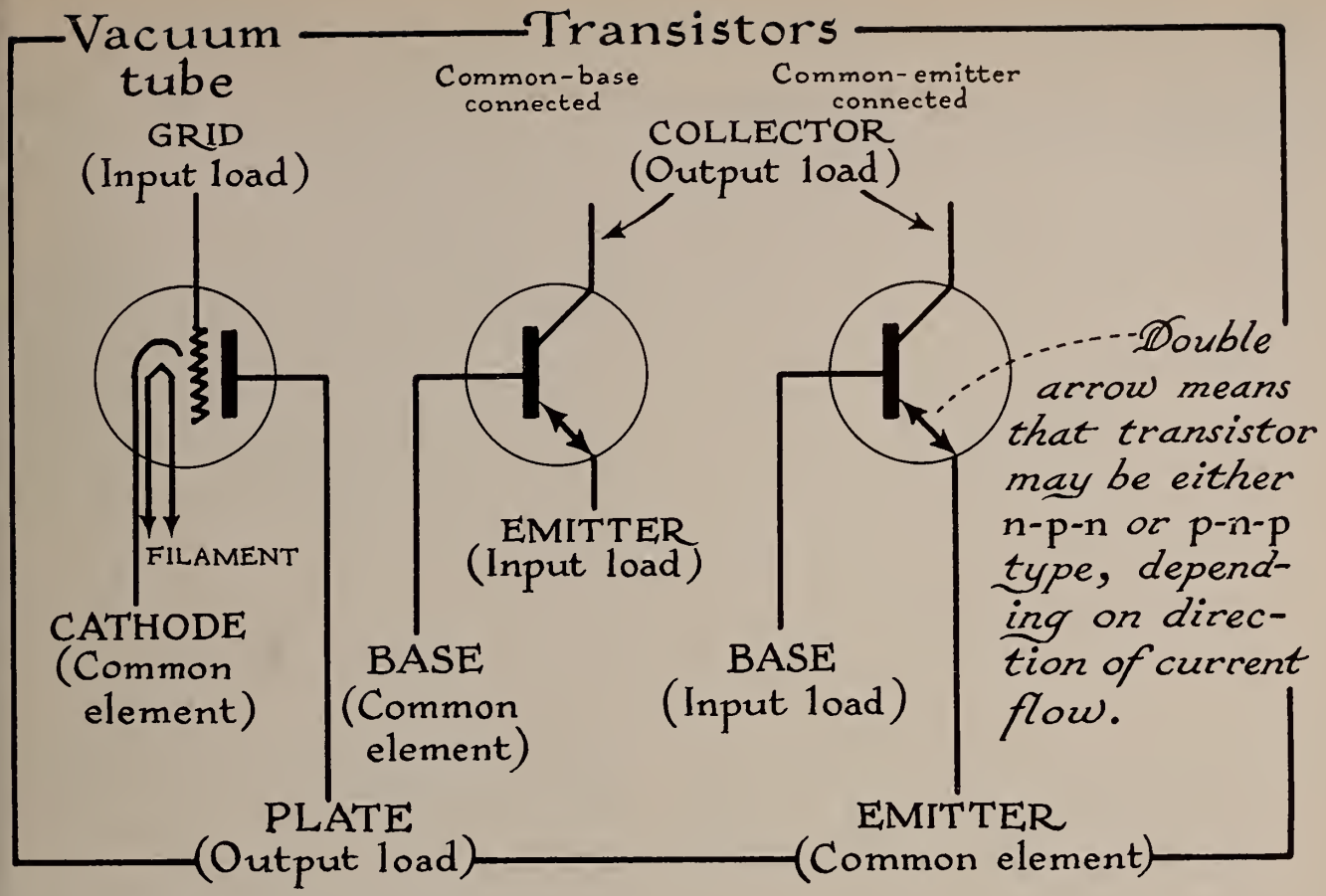


FIG. 3 — Comparison in conventional electrical symbols of a triode electron tube and triode transistors. Note the two

with a common-base connection (e.g. about 30 ohms when common-base connected; about 1000 ohms when common-emitter connected).

Versatility of Transistors

All the foregoing reveals an interesting fact about transistors. Whereas a triode tube can be connected up only one way, triode transistors can be connected up four ways — two ways for the p-n-p transistor, and two ways for the n-p-n transistor! These hookups are diagrammed in Fig. 4 — one for an electron tube, four for the transistors.

The five circuits shown in Fig. 4 have been simplified by the omission of the bypass capacitors normally shunted across the sources of bias current (the terminals marked with + and − symbols). Bypass capacitors allow the fluctuating audio currents to flow through the input and output circuits without being forced through the current supplies, which might weaken them or distort the sound.

If the preceding elementary principles have been comprehended, you are well on your way to a full understanding of transistorized sound systems. Weak audio currents "injected" ways of connecting each type of transistor, p-n-p and n-p-n, four ways in all. Triode tubes can be connected only one way.

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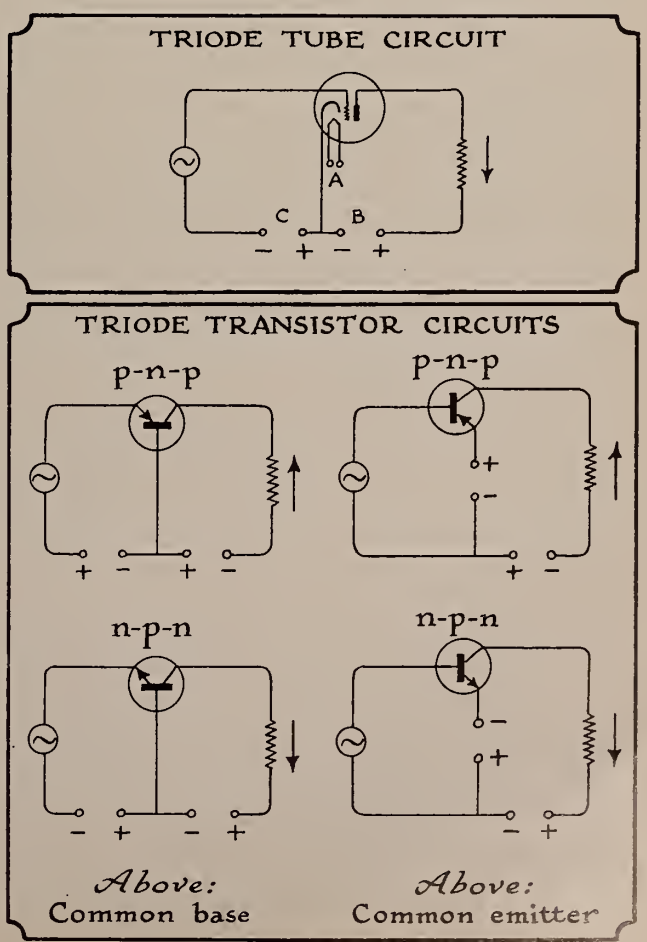


FIG. 4 — Single-stage amplifier circuits employing a triode tube (top) and base- and emitter-connected p-n-p and n-p-n transistors. (The bypass capacitors normally shunted across the sources of bias current have been omitted to simplify the diagrams.) Transistors are thus very versatile.

The Evolution of the Williamsburg System: Motion Picture System from Camera to Viewer

By BEN SCHLANGER

The following, the second of two articles on the planning and construction of the twin motion picture theatres at Colonial Williamsburg, appeared originally in the Journal of the Society of Motion Picture and Television Engineers. The Editors of International Projectionist gratefully thank SMPTE for permission to reprint the Williamsburg Story written by Arthur L. Smith, Williamsburg audio-visual director, and architect Ben Schlanger of New York. In this second article on the planning for the theatre system, Mr. Schlanger is the author.

The proposal for a very special type motion-picture presentation for Colonial Williamsburg specified a practical and economical system that would be able to project an illusion of reality beyond that of a conventional "movie." The effect, as nearly as possible, would be that of living re-enactment of events just prior to the American Revolution.

Also the presentation to the visitor to Colonial Williamsburg had to be unusual, differing from all of the comparatively new types of film projection being introduced at about the time this program was started.

If Cinerama, CinemaScope or even just the most modest wide-screen developments, all comparatively new at the time, could have been exclusively used by Colonial Williamsburg the problem might readily and quickly have been solved. But we had to have something more than any of these systems could achieve and we had to accomplish it without any radical changes in any of the equipment, optics, or film developed to this time.

We chose to use available equipment and processes in a new way to take advantage of this unique opportunity. Our goal was to build a theater and to produce a film, using the greater film area per frame available, that would enable the viewer to feel that he was "at the scene" and participating in the events shown on the screen.

For this "illusion of reality" it is necessary to have "picture dominance," sufficient resolution of photographic detail and a suitable cinematographic technique. The first reaction to these specifications from the motion-picture industry was discouraging, the general attitude being that it was too much to expect that a motion-picture film could be made to be shown only in a specific theater or that a theater could be specially designed for a given film. The Colonial Williamsburg project was to be the first example of such a coordinated and related procedure to achieve this end result. In Colonial Williamsburg we found the first opportunity to plan the theater and the film to be shown in the theater and to profit thereby from all of the advantages presented by this combined effort.

Frame Area and Seating Capacity

The availability of a film area per frame greater than the amount obtainable with standard 35mm projection was the first requirement in this project. The film dimensions for the VistaVision frame are shown in Fig. 1. It should be noted that by using the small perforations, six 50-mil soundtracks, one each outside and two inside, are available and since these are running at 180 ft/min, rather than the usual 90 ft/min, a 100-mil track equivalent (to single-frame sound) is obtained.

With this new film presentation technique there is a definite relationship between the film area per frame and the possible seating capacity of the theater auditorium. The film area per frame of standard 35mm projection would have yielded insufficient seating capacity.

Seating capacity is determined in this case by the minimum and maximum viewing distances and the width of the viewing pattern. In turn these dimensions are determined by the size of the projected picture which in turn is determined by the film area per frame, the projection optics and the projection light available. The horizontal VistaVision projection system used in this project made it possible to project a picture of good quality 52 ft. wide and 26 ft. high which could be viewed from a distance of 33 ft. or more without revealing film grain or fuzz. The bottom of the projected picture was placed at a level approximately even with the floor under the first row of seats so that the top of the picture would not be unnaturally high for the first row of seats and yet high enough so that the top edge is not too easily visible to any of the entire audience.

The vertical and horizontal range of vision was studied to aid in determining the proper position for the top of the projected picture and the maximum viewing distance,

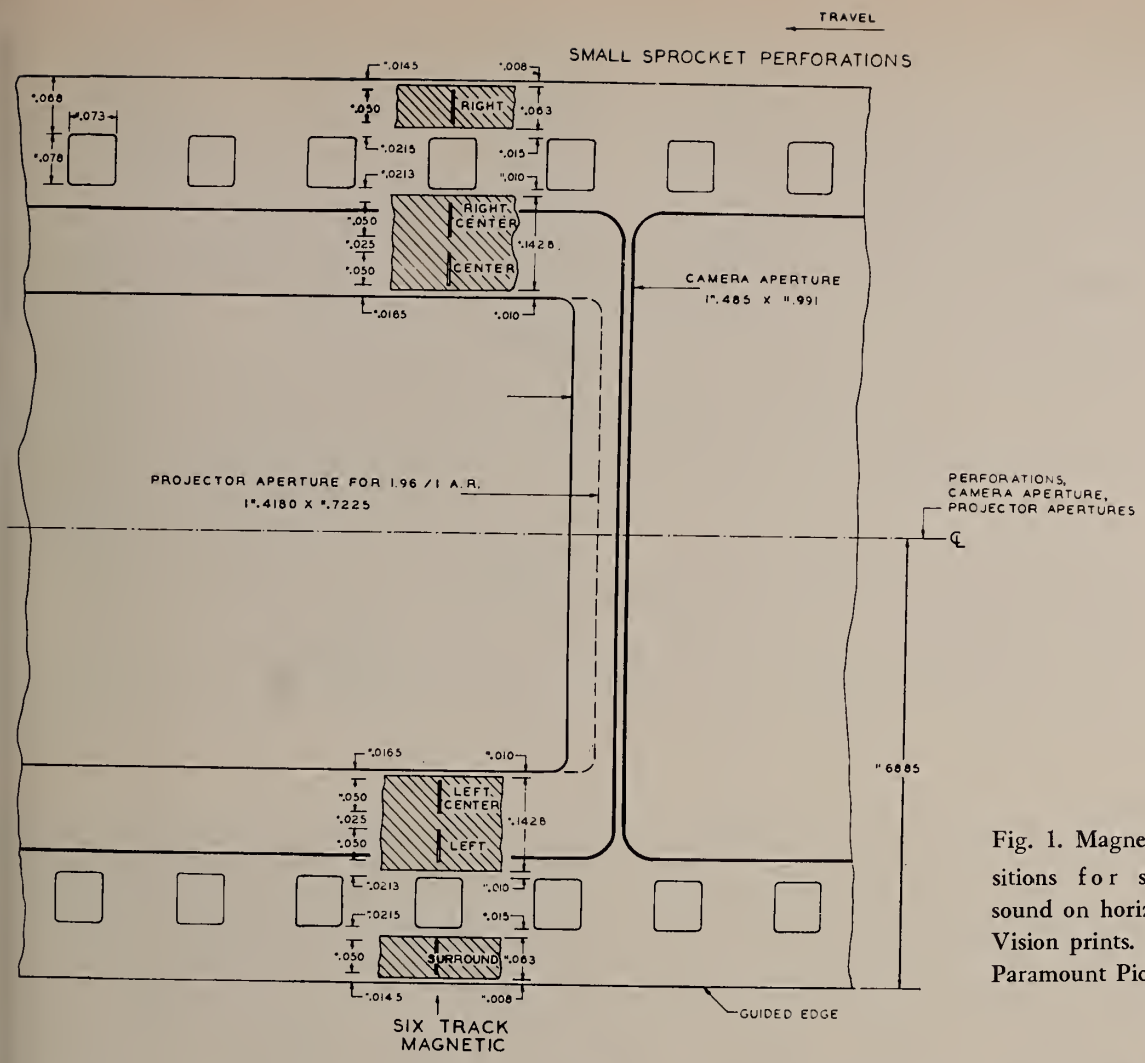


Fig. 1. Magnetic track positions for six channel sound on horizontal Vista-Vision prints. (Courtesy of Paramount Pictures Corp.)

limited by the vertical and horizontal angles within which one could see without being aware of head or eye movement. This range was selected as the range within which most of our visual experience time is found. The horizontal range was found to be approximately 60° and the vertical range about 15° above the true horizontal level. The "picture dominance" effect is possible when the top margin and side margins of the projected picture are positioned so as to fill the whole range of vision described by these angles. This in turn enables the viewers to have the walls and ceiling of the auditorium enclosure beyond their easy range of vision, and usually when the viewer is concentrating on the performance the head does not turn to see beyond the picture area.

The Screen

Some detailed consideration may now be given to the screen before describing the viewing area and the projection facilities.

The giant 120-ft. screens are the result of considerable original research by the authors of these papers who tested almost every known screen material with many variations of surface and gain in an attempt to find a material which would have the desired amount of reflectance and which, in the extensive and curved surround portions, would be properly sympathetic in reaction to reflections from the projected image area. Embossed screens were of particular interest but none of these could handle the light perfectly throughout the entire curvature of the screen. As a matter of fact, neither could the standard aluminized surfaces until graded spraying was introduced.

The projection area extends from floor to ceiling; therefore the screen must extend beyond these extremes. Without the elimination of the vertical supports, it would be necessary to thread the huge one-piece screen between the upright members — a procedure which probably would have distorted the flexible plastic. With a frame devoid of vertical supports, the actual installation was accomplished in less than six hours.

As may be seen in Figs. 2 and 3 the curvature of the screen was to be complex, probably more complex than any ever attempted elsewhere. It is two modified S curves and there was considerable doubt that a screen could be hung in this manner without wrinkles and extensive bellying; however full-scale tests engineered by Selby Industries at Cleveland demonstrated the feasibility of the idea.

In the final installation the screen was stretched on a pipe frame that threaded through adjustable brackets, thereby permitting the desired curvatures. No vertical members were used in the frame. The top brackets were fastened to the ceiling and the bottom ones to the floor. This was highly desirable because the screen, being higher than the ceiling, had to be unrolled from the back.

Although the screen image was to extend to the full screen height of 26 ft., the horizontal measurement was to be only 52 ft. at which point it was to blend into a continuing screen surface surround. The blend was accomplished initially by having the outer rays of the projected image meet the screen at its point of greatest curvature.

However, the print of the transition and surround area proved to be too reflective when coated with 1.7 gain necessary for the image area. Blended spraying reduced the

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No wonder so much time, money, and materials is spent in making motion pictures more effective. Nor is it any wonder that this investment is so rewarding, or that the Eastman Technical Service is constantly engaged in helping the industry solve its questions of production, processing and projection.

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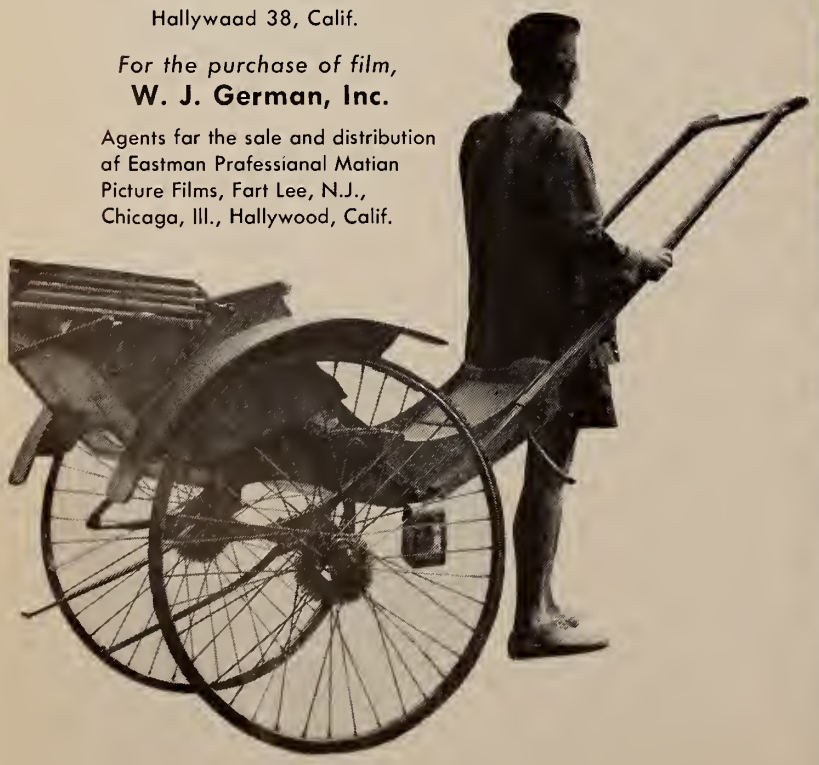
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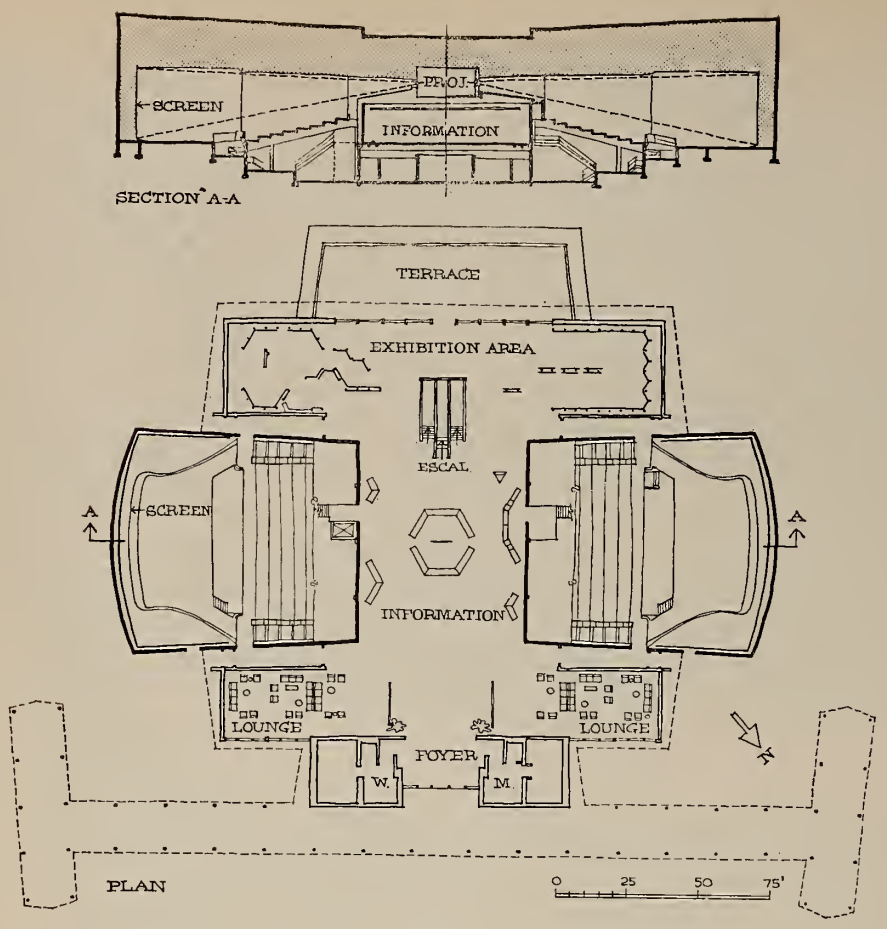


Fig. 4. Plan of theater. (Courtesy of Architectural Forum.)

surround gain to a desired 1.3 and this proved to be quite satisfactory.

A maintenance procedure which may prove of interest to others is the practice of removing dust accumulations on this large screen by means of hand rollers covered with soft, disposable felt.

Design of the Viewing Spaces

The 60° horizontal range dictated a maximum viewing distance of about 61 ft. which permitted eight rows of seats liberally spaced at a distance of 4 ft. The very low position of the bottom of the picture also made it appear that the picture filled all visible space. The liberal row spacing was needed to permit quick ingress and egress for the continuous change of audience every 40 minutes. With all of these requirements we were able to develop 240 seats in the seating pattern, restricting the width of the pattern to about 5 ft. greater width than the projected picure, and so avoid a distorted view of the image from extreme side seats.

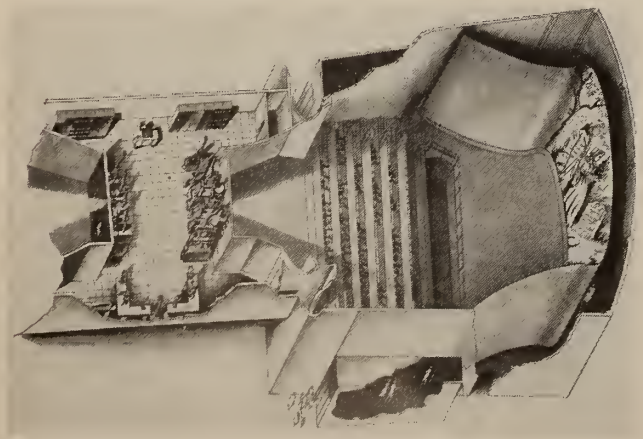


Fig. 2. Isometric drawing of Williamsburg Information Center Theaters. Note entrance area at bottom functions as light lock. Light level adaptation can occur in this passage.

The number of visitors anticipated for the performance was calculated to be 500 every 40 minutes or 500 per showing of a 40-minute film. This requirement had indicated the need for two separate viewing spaces and this duplication was readily accepted because it also made it possible to stagger the starting times of the showings so that a showing could start every 20 minutes. As Fig. 4 indicates, a single projection room was placed between the two viewing spaces with a complete set of projectors for each screen of each viewing space. To provide sufficient projection distance for a 52-ft. projected picture and yet be able to use an acceptable projection lens it was necessary to increase the projection from the screen to a point beyond that which would otherwise have been suggested by the position of the row furthest from the screen. This requirement increased the total length of the structure with the resultant extra space being used for a much needed foyer and exhibition area under the viewing spaces.

As noted above these viewing spaces are designed for films made specifically for showing in these viewing spaces and in none other. For example, because the projected picture is so large for the dimensions of the viewing pattern it becomes unnecessary to use more than one focal length for the cinematography. Short focal length lenses producing the so-called close-up shot are deliberately avoided because satisfactory visual acuity is assured with the limited viewing distances. Also, the figures of people and objects are kept in a relatively lower and more natural position on the screen with a medium focal length lens. Another requirement is to keep figures of people and objects somewhat away from the



Fig. 3. The theater seen from the rear shows the illuminated barrier walls and the curvature of the screen.



Fig. 6. Continental seating and generous aisles are illuminnated from below seats. Barrier walls between seats are also illuminated.

top and the sides of the screen so as to provide a much needed peripheral area beyond the main points of interest of a given shot. Important detail is kept away from the marginal areas of the picture so that these areas can be used for a vignetting and blending of the picture into walls and ceiling contiguous and continuous to the screen. These transitional areas are seen only out of the corner of the eye because of the seating pattern design and the walls and ceiling are seen only if a viewer turns his head deliberately away from the normal viewing direction. Even if such an unusual turn of the head is made the blending of picture and picture surround is soft and not in any way distracting. This is accomplished by having the screen surface continue into the surround with the same color and texture as the screen and also by controlling the amount of light re-reflected from the screen from this surround area.

With the screen filling the entire space from floor to ceiling, no curtains or contrasting frame maskings are used. Instead of the usual structural walls on either side of the screen, the screen material itself continues to become the screen surround. There is no room for any artificial "picture-on-the-wall" effect. It is even possible for the viewer to become oblivious to the space enclosure where he is sitting as he becomes more absorbed in the screen. Another step toward bringing about the illusion of reality and heightening viewer participation was that of concealing the presence of other viewers and making sure that the traffic aisles would not be visible. Low walls were built to conceal other viewers while not obstructing the view of the projected picture, and traffic aisles along the extreme side seats are out of view (Figs. 5 and 6).

Each row of seats is elevated sufficiently above the preceeding row to assure unobstructed vision of the projected picture over the low walls. The entrance and exit doors to the viewing spaces are located so that they do not appear within easy range of vision when the projected picture is on view. There are no secondary sources of light visible for room lighting during the picture projection period. Sufficient light for safety purposes comes from the screen itself and from low-level carpet lighting in the side aisles which does not show to the viewers' eyes. During the emptying and filling periods the viewing spaces are illuminated with an overall skydome effect by concealed flood light and concealed lighting within the low separating walls between the rows. These walls are plastic-lined perforated stainless steel to enhance the effect of floating in a uniform and evenly lighted space. From these viewing spaces there is no way of measuring distance to the screen because there is no yardstick of visible people, furniture pieces or architectural elements or even differences of shading of light to serve as clues for sensing distance. This feeling carries into the picture projection period. Care was taken even in the selection

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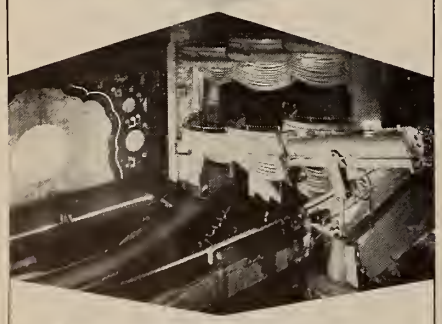
Fig. 5. Eight rows of seats are separated by barrier walls.



Fig. 7. Each theatre is equipped with two VistaVision projectors and one 16mm arc projector. Also available are 2 x 2 slide projectors and a standard 35mm projector.

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David Holzman, All Officers Reelected By IA Ops 367

EVANSVILLE, Ind. — At the Dec. 18 meeting of Moving Picture Machine Operators Local 367 here, the following incumbents were reelected officers of the local, after having been renominated without opposition.

David Holzman is president, Ivan Langford first vice president and Oliver Phipps second vice president. Recording secretary is L. E. DeWitt and financial secretary is Paul V. Burlison.

Robert Skinner is sergeant-at-arms and Herbert Feldpausch is trustee. **iP**

Grauman's Chinese Installs Norelco 70/35 Projectors

The famous Grauman's Chinese Theatre in Hollywood, Calif., has installed Norelco Universal 70/35mm projectors, it was announced by Niels Tuxen, general manager of the motion picture equipment division of North American Philips Co., New York City. The installation was made in preparation for the engagement of the new 70mm picture "West Side Story" distributed by United Artists.

Tuxen added that some 130 theatres in the U.S. are now equipped with Norelco 70/35 projectors, including a number of drive-ins. "The amount of 70mm product available is rising sharply. A recent survey showed that approximately 70 pictures have already been released or are being planned in the 65mm and 70mm processes," he said. **iP**

Arthur Silverman Heads 25-30 Club for 1962

NEW YORK — Arthur Silverman will succeed to the presidency of the 25-30 Club for 1962. The election and installation of officers of the club was held last month at the Hotel Claridge.

The new 1962 slate of officers, headed by Silverman as prexy, will be comprised of Joseph Kleinman, vice president; Morris J. Rotker, recording and corresponding secretary; Jacob Krimon, financial secretary and treasurer; Nathan Strauss, sergeant-at-arms; Charles Sherman, trustee; the latter to serve a three-year term.

Nominated to hold their present posts are Morris Rotker, Jacob Krimon, Nathan Strauss and trustees Julius Wetzler and Harry Bergoffen, who were elected to serve three-year terms.

Morris I. Klapholz will carry on as editor of the Official Bulletin, with Rotker as associate editor.

The annual banquet was held at the Hotel Empire Jan. 11. **iP**



SPOTLIGHT — To permit modern spotlighting of "live" attractions on stage, the Howard Theatre, Washington, D. C., has installed the Strong SuperTrouper carbon arcs. Shown operating is Clyde Ford.

Louis Levin Heads IA Local 253

ROCHESTER, N. Y. — At an election in December, Louis Levin was elected president of Local 253, IATSE. Charles Tibbets is vice president and Frank Coniglio business agent.

Frank Placeran is treasurer and financial secretary; Walter A. Knopf recording secretary, Albert Hill sergeant-at-arms, and Joseph Vecchio, Sr., delegate to the Central Trades.

On the executive board are Joseph Pandina, Louis Goler, Fred Hart and Robert Craig. Trustees are Mr. Goler, Abe Orden and Lester Barager, with Fred Hart, Ernst Henley and Fred Closser trustees of the welfare fund. Financial secretary-treasurer of the welfare fund is Mark Harloff, Sr.

iP

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Next Issue:

Multichannel magnetic sound, which has made the "big picture" as excellent to the ear as its wide-screen color is to the eye, and which brought on home stereo, owes part of its present progress to improved electronic aids. Next month, Robert A. Mitchell discusses this new sound and the phototransistor—the electronic eye which makes it possible.

Transistors . . .

from page 7

into a triode transistor control the strength of a relatively powerful bias current, and thus amplify in the manner of the triode electron tubes with which projectionists have been familiar since the inception of talking pictures.

Capabilities of Transistors

Transistorized amplifiers for motion-picture sound systems have the advantage of compactness, ruggedness, low purchase price, economy of operation due to very low power consumption (no filaments) and indefinitely long transistor life, low noise level, freedom from "microphonics," and simplified circuitry for high sound fidelity.

As preamplifiers for both magnetic and optical sound reproducers, transistors have no peers. Their low-impedance output permits long cables to be used between preamplifier and power-gain stages without the need for cumbersome, expensive, sound-distorting matching transformers. Indeed, the use of phototransistors in place of conventional emission-type photoelectric cells permits direct coupling to the transistorized preamplifier without matching transformers or power-robbing resistors. Photo transistors, like amplifier transistors, are low-impedance devices; and they have many other advantages which will be mentioned in the next issue of IP.

As power amplifiers to drive the stage speakers, transistorized amplifiers may be connected directly to the loudspeakers without matching transformers. Such power amplifiers also possess all the advantages mentioned above for transistorized preamplifiers, but the disadvantage of low power capacity.

Power-gain transistor amplifiers begin to distort badly if their maximum capacity of about 20 watts is exceeded. Three commercial manufacturers rate their transistorized power amplifiers at 15 watts. This is enough power to supply ample undistorted sound in small theatres. For larger theatres, several such amplifiers are multiplied to furnish 30, 45, 60, or even 75 watts of undistorted power to the auditorium.

When operated somewhat below their maximum power rating, transistorized amplifiers evidence much less nonlinear harmonic distortion and unpleasant intermodulation effects than many electron-tube amplifiers costing much more to buy, operate, and service. **iP**

WILLIAMSBURG

from page 13

of the texture of all surfaces to be sure that all light would reflect evenly from all surfaces.

Projection Booth

The basic size of the booth is 50 by 50 ft., but part of this is lost in front of the projection machinery where it becomes a "throat" into the theaters. It is large, clean, acoustically treated and air-conditioned (Figs. 7 and 8).

Four horizontal VistaVision projectors are the principal equipment in the booth, with two facing into each theater. In addition, each theater has a 16mm Eastman Model 25 Arc Projector and a double slide projector equipped with an optical dissolve mechanism. The VistaVision projectors are generally standard but do have some important modifications. Curved gates and larger intermittents and sprockets carry the film better. The Brush soundhead picks up the sound signal ahead of the picture. Special reels, 28 in. in diameter, carry the entire 37-minute show and require 30-in. magazines. Half-inch spindle shafts are used.

The relatively short projection throw required the use of a 2¾-in. lens and the Bausch & Lomb Super Cinephor which was chosen has been quite satisfactory. Optical problems resulting from the use of a short lens and a condensor-type lamp resulted in a shift to mirror-type lamps. The mirror-type lamp enabled an amperage reduction from 180 to 135 amps. Ashcraft lamps, modified slightly, produced a flatter field of better quality light. Three trims were obtainable from a carbon; instead of one, at 180 amps.

A design for maximum lamp to screen efficiency led to the elimination of glass in the booth portholes. Since the double-speed VistaVision projectors make more noise than the single-speed variety, it was necessary to design an acoustic hood for the area between the projector and the port. This was designed by the firm of Bolt, Beranek and Newman.

The projectors are powered by d-c generators and three 300-amp units are on call. When the lamphouses were changed from condenser-type to mirror-type and the power for each machine reduced to 135 amp, only one generator was necessary at a time and this has enabled the other units to be rotated and serviced for maximum efficiency.

The rewind area of the projection booth contains two torque-motor-driven rewinds. They are installed on low tables at which operators can sit comfortably during the rewind and inspection process. A Bell & Howell pedestal-type hot splicer is located midway between the two rewind tables.

The storage of the oversized reels of film was a problem which was nicely solved by placing them in slightly ramped compartments. When the narrow door of a compartment is dropped to become a supporting rest, the reel of film, via simple gravity, rolls forward to a cushioned stop and can be easily picked up by the operator and taken to the projector. The total weight of reel and film (6600 ft.) is 42 lb.

All booth wiring is located in large accessible recessed floor and wall conduits. Of particular interest are the control stations provided conveniently beside each machine (Fig. 9). Within these control stations are housed complete master operations including:

(1) all necessary on-off switching,
(2) automatic segues from one sound source to another,
(3) a master up-down pushbutton set to control all lights,
(4) cue and voice signals from the stage area, and
(5) time clocks which reset by lever action.

Much of the automation included in the central controls is valued because it eliminates the human variation which occurs in such operations as manual fading. The motor-driven automatic seque takes place in about four to five seconds and provides a smooth transition blend of

sound. Although the idea for this came from Mr. Smith, the actual design of the unit and other specialized Altec installations are to be credited to Dave Demarest of that firm.

Each theater has available a two-track Ampex stereophonic tape machine for intermission music and the sound output normally is fed to behind-the-screen speakers Nos. 1 and 5 (the outer units). The Ampex-type units can be started and stopped remotely at the central control station.

The control stations are important both in terms of innovations and logic. In the vast majority of theaters in operation today, control points tend to be scattered all over the booth. All too frequently intermission music is obtained from turntables and scratchy records. High-quality sound from tape is certainly better and seems to be appreciated by the audience.

Audio monitoring of the six-track film sound is also available when the operator is standing at the control station. Each track may, if desired, be monitored separately.

The main amplifier banks include spare circuits and plug-in components which enable rapid switchovers when trouble occurs.

Each of the two theaters contains a public address system which has amplifiers and speakers separate from the film sound equipment.

It may also be of interest that each theater was provided with a Budelman wireless microphone setup. It was necessary to replace the antenna provided with a conical TV type in order to obtain best results.

Inasmuch as the theaters are used during the evening for presentation of special lectures, provision for the use of slides was necessary. Two Strong Arc Projectors with a dissolving mechanism and automatic picture feed were assembled by W. A. Yoder of Richmond, Virginia. The Ampex stereo machines, also supplied by Mr. Yoder, have a special provision whereby, when used to play a prerecorded talk on one track, can provide a signal from the other to activate the automatic feature of the slide projectors. Hence a complete show can be presented automatically and the frequency of slide changes need not be by fixed interval.

Outside of the entrance door of each theater is a time signal in minutes which shows the number of minutes before the next show begins. The starting digits can be dialed from the booth and clock action reduces the numbers.

Both entrance and exit doors operate automatically when patrons approach under-carpet switches.

Lighting

The theaters are equipped with complex automatic dimmer systems wherein different areas of lighting can be preset and the whole can be controlled by a single pushbutton located at control stations. There are "light adjustment locks"



Fig. 8. The rewinds in the foreground accommodate such large reels that special consideration was given to the torque problems of the rewind motors.

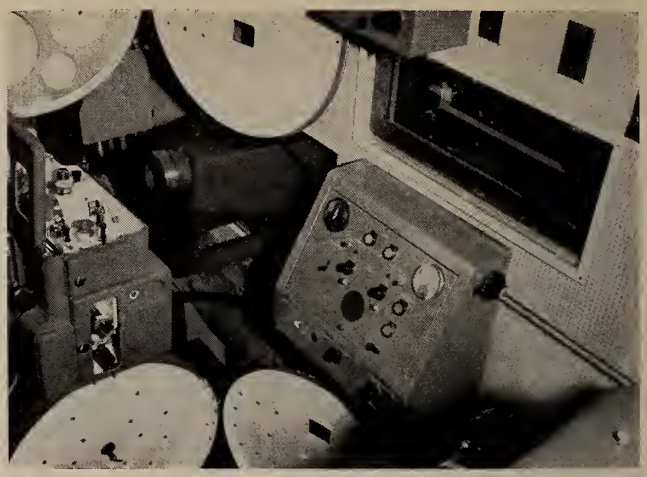


Fig. 9. The control stations beside each machine are thought to be unique. With the exception of firing the arc, all controls are at this station including remote stereo tape for intermission, motor start, master button for dimming circuits, automatic sound segue, program timing, stage communication, etc. To the left of the control station are the acoustic hoods which snug up against the projector when in use. This devise permits glassless ports.

which the visitor passes through on his way from the brilliantly lit lobby to the theater interior, and these provide a partial adjustment in level. During the performance these are faded out. At present only two principal light sources are used for auditorium lighting. One is strip lighting beneath the seats which also illuminates the barrier walls between the rows. The second is screen floodlighting. The latter has available three primary colors plus white spotlighting where patterns may be projected. Rear cove lighting and ceiling spots are used on other-than-film occasions and panic lights are available for emergencies and cleaning.

Although this complete facility is used at one time or another, the standard choice for intermission screen lighting has been "unearthly" blue which suggests a mystic mood. Many people entering the theater for the first time see no screen at all — just a soft haze of blue light.

As the lights are dimmed, a film image appears and the audience is in a dense forest. Only the sound of twittering birds is heard. The camera dollies towards a small bright opening through the trees and as the bright image grows larger and larger it reaches the full 52-ft. size — an awe-inspiring sight.

No titles or credits are projected on the screen. These are shown in an illuminated showcase permanently located in the lobby.

Conclusion

The desire in the designing was to permit the viewer to the fullest possible extent to be able to transport himself in imagination to a different time and space by furnishing a floating void or optical vacuum to provide the transition to the new time and space and to hold him there by eliminating all distractions. The name **Transcenium** suggests itself for this type of presentation. Long light locks having intermediate light levels serve as a transition from conditions of the outer foyer to the special spacial effect of the viewing enclosures.

Larger seating capacities are possible with this type of presentation by using still greater film area and using a less commodious seat row spacing. It would be possible to project a good-quality picture 63 ft. wide with 70mm film and thereby provide about 400 seats on either side of one projection room. The combined seating capacity of 800 seats for such a transcenium presentation would, it is believed, bring a fuller enjoyment to more film fans. **iP**

New Art House Boom In New York City

NEW YORK — Should New York City's current movie theatre building be a countrywide index, the industry can look forward to four out of six new theatres as being art houses in downtown metropolitan areas.

Two of New York's new theatre projects will house two movie theatres under one roof. All six new theatres are scheduled to open in 1962. The capacities of the theatres range from 900 to 300 seats.

The two "piggy-back" theatres are diagonally opposite each other on Third Avenue. They are the Rugoff Theatres' Cinema 1 and Cinema 2, being constructed in a new building between 59th and 60th St.; and Walter Reade Theatres' Coronet, which the company will build atop its Baronet Theatre at Fifty-eighth Street.

Since Cinema 1 will have a capacity of 750 seats, big enough to present major Hollywood films simultaneously with their Broadway openings, this is classed with the bigger RKO Theatres' new 23rd St. Theatre, which is being constructed near Eighth Avenue. It will be a 900-seat house.

Other art houses are being built by Brandt Theatres, the New Town Theatre at 55th Street and 9th Avenue; Robert Ferman and Meyer Ackerman, operators of the Carnegie Hall Cinema, are building a 600-seat art house on 57th Street and 7th Avenue, to be called the Lincoln Art Theatre; and Loew's Theatres, who plan to put a 600-seat house in an apartment building at 72nd Street and 3rd Avenue.

iP

Back Issues, Anyone?

The editors of INTERNATIONAL PROJECTIONIST have received a number of inquiries recently for back issues of the magazine. We have been unable to fill many of these and it has occurred to us that many of our loyal subscribers may have accumulations which they no longer need. If so, we will be glad to act as a "clearing house" bringing together those who want and those who have back numbers. The requests are usually for "runs," or consecutive issues covering periods of a year or more. DO NOT SEND us the magazines, but supply us with lists of what you have available. We will transmit this information to those wanting back numbers. Price and terms are a matter for negotiation between buyer and seller. The editors of Intrenational Projectionist assume no responsibility for such transactions, we merely offer our services to bring together the "haves" and the "have nots." There is, of course, NO charge by IP for this service.



NEW INSTALLATION — The Cascade Theatre, Vancouver, B. C., can new boast of having the most brilliantly projected pictures of any theatre in Canada, having made the initial installation of Strong Jetarc projction arc lamps. (Literature on this type of equipment will be sent to any reader — write the Strong Electric Corp., 31 City Park Ave., Toledo 1, Ohio.)

Ernest Apperson Dies in Los Angeles

LOS ANGELES, CALIF. — Ernest Apperson, a member of the IATSE since 1908, died here recently, survived by his wife, son and two brothers.

A member of two locals, Hollywood Projectionists Local 165 and Los Angeles Theater Projectionists Local 150, Mr. Apperson was a former business agent for Local 150 and a member of the negotiating committee for Local 165 until his death.

iP

Wallace C. Robbins Joins Florman & Babb

NEW YORK — Florman & Babb, Inc., as part of its continued expansion, has announced the appointment of Wallace C. Robbins as head of industrial sales.

In this capacity, Robbins will specialize in servicing the professional motion picture equipment requirements of the rapidly growing industrial in-plant studios.

Prior to his present appointment with Florman & Babb, Inc., Robbins was associated with Camera Equipment Co., Inc. in equipment sales for the past four years. His professional experience also includes seven years with De Luxe Laboratories in color quality control and five years as a portrait and commercial photographer.

iP

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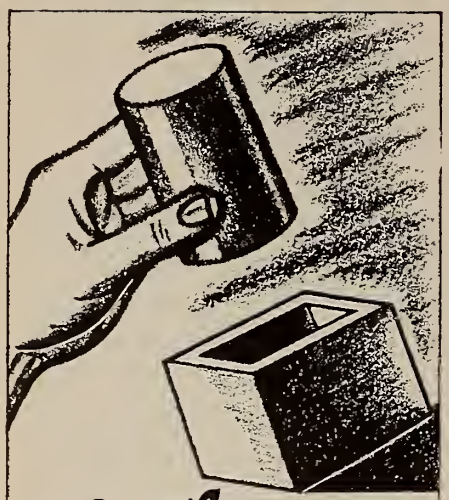
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Projectionist Profile

Perry Made British Movie History at Theatres in London's West End

A lot of British movie history was made in London's West End theatres during the years 1928 and 1961, and Stanley T. Perry, who commenced in show business in 1912 and now is projection supervisor for MGM, London, was an active participant of the progress in film presentations as chief projectionist at the Empire Theatre in Leicester Square, which was bought by the Metro company in 1928.

(Incidentally, IP readers will have the opportunity in the February issue of reading Stan Perry's first article in a continuing series about new projection developments in England).

Perry's association with MGM has run a span of over 39 years — since August, 1922, when Metro Pictures Corp. premiered "The Four Horsemen of the Apocalypse" at London's Palace Theatre. Again, he projected the first picture at the opening of the Tivoli, leased by Metro company in September 1923. The theatre was bought by the company in 1926, during the run of the first "Ben-Hur." Every big MGM production played this house between 1923 and October, 1928, when the theatre was sold.

MGM opened the Empire Theatre, Leicester Square, in November 1928, and Perry opened the house with "Trelawny of the Wells," co-starring Norma Shearer and Conrad Nagel, a silent film. From that time, MGM opened its big attractions in London at the Empire Theatre, including the second "Ben-Hur" in 70mm and stereo sound. The new "Ben-Hur" concluded its run at the Empire, when the theatre was sold in May 1961, and was moved over to the Royalty Theatre, Kingsway, where it is still playing.

Except for three years when he served in the British Army in World War I, Stan, during his working life has been in the film business, and most of that time he was a projectionist. Even in the service, after the Armistice, he was an operator for the army cinemas at camp shows.

He returned to civilian projection in June, 1919. Then he was appointed floor electrician at the old Stoll Studios, Cricklewood. He served in the studio from October 1920 to 1922, working with sunlight arcs, and among the productions he worked on was "The Glorious Adventure," featuring Victor McLaglan and Lady Diana Manners, the first British feature filmed in Prizmacolor, the forerunner of Technicolor.



Stan Perry

Stan got back to theatre projection in April, 1922, when he opened the run of big pictures and premieres at the old Philharmonic Hall, London, for the Fox Film Company, among them "Queen of Sheba," "Monte Cristo," and "Tale of Two Cities."

When MGM sold the Empire last May, Perry bought the coffee table and two chairs in the theatre's Sea Lounge, as a "souvenir of thirty two-and-a-half years making movie history in London's West End." He has them at his home at Widley Road. (see illustration).

Perry officiates as projection supervisor when any big show or premiere is held involving an MGM production, such as last November's personal appearance of Bob Hope at a charity benefit on his "Bachelor in Paradise" in London, and the European premiere of "King of Kings" last year.

Stan Perry is an old timer in projection, and his long association with MGM, London, testifies he more than qualifies as a projection engineer, like all the old timers who kept up with new developments such as CinemaScope, Todd-AO, 70mm projection and stereophonic sound, which they took in their stride. **iP**

LEO JURJOVEC DIES

CANON CITY, COLO.—Leo Jurjovec, long time member of Chicago Moving Picture Machine Operators Local 110, died recently here, where he had been living, and where services and interment were held. **iP**

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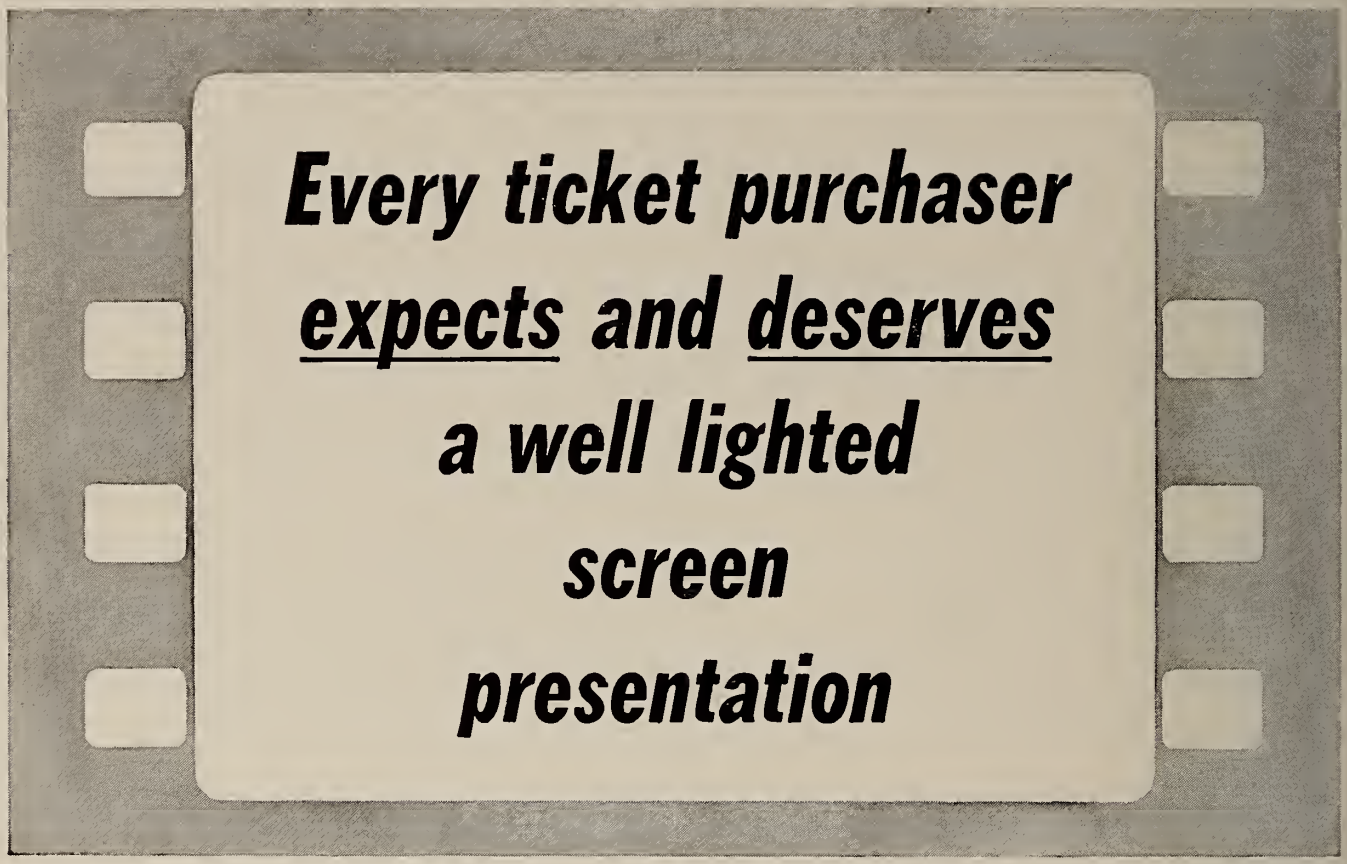
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Volume 37 February, 1962 No. 2

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New York 17, N. Y.
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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

WHICH HILL ARE THE INDIANS BEHIND?

News reports from throughout the projectionist craft indicate that we are running into more and more trouble from automation, and the scientific developments within the film projection and audiovisual fields. This situation is going to get a lot worse, and chances are it will never get better.

It is just another indication that the time is nearing when everyone in motion picture exhibition, whether projectionist, exhibitor, ticket girl or usher better start worrying about the common enemy — the miniaturization and cheapening of the motion picture so that it can be fitted into a blue-grey, 21-inch screen.

In an article in this month's audio-visual section, the reporter calls attention to great savings in TV newsreel production, by the elimination of half the film cost, the switch to 8 mm, and the ever-present attempt to do things faster and cheaper — not better, just faster and cheaper.

No one in his right mind would ever suggest that pay television, particularly that to be sent into the home, offers any small part of the quality, the atmosphere, the downright enjoyment of seeing that same story on a theatre screen, filmed in 35 mm or larger. However, in this age of the shoddy our citizens are ready to settle for Ben-Hur on their living room wall because they feel it will be practically free, because they won't have to leave the footstool and the beer, and unfortunately because they are more than impressed by this world's technological advances and want to share in them in some way — that was true in Technicolor, and there is no reason to feel it won't be true in pay television.

Another news item cites the concern of a New York group over "automatic projection," ranging from self-threading projectors to completely automated projection rooms. If the theatre market were large enugh to justify the considerable research and development cost, we might now have self-threading 35 mm machines. There is continuing development of this kind in England, and in Europe. There the number of theatres, the ratio of theatre-goers to population and the continuing importance of the motion picture place the individual projectionist in a much better position than in the United States; even though his pay scale may be lower, he can be more certain that he will always be able to practice his craft.

Let's make no mistake about it — there is a constant hammering at the door of our industry. We opened it for television and our industry shrunk by half almost overnight. A shortsightedness in many organizations left the television projection field to others, or resulted in internal dissension. The jimmy tools of pay television at our door will reduce our ranks by another half, at least. Only drive-ins saved locals in many sections of our nation, and they reduce the projectionist to a seasonal employee in all but the year-round skytops.

Interest in automation comes about because of high operating costs as well as the desire of some industries to have the latest of everything. There is no desire in many theatres to have the latest (many projectionists run into this every day) but our business deserves everyone's cooperation to see that a combination of more convenient, if less desirable, entertainment and insupportable operating costs does not reduce the ranks of the motion picture industry any further.

INTERNATIONAL PROJECTIONIST

Volume 37 February, 1962 Number 2

Phototransistor:

New Electronic Eye

By ROBERT A. MITCHELL

EVEN THOUGH the first commercially demonstrated talking pictures made use of synchronized phonograph records for the sound — the so-called Vitaphone system pioneered by Warner Brothers — it has always been recognized that truly practicable sound movies must employ a sound record on the film, itself. Accordingly, two compatible types of photographic soundtrack, the variable-area and the variable-density types, were specified and developed from the outset.

It is quite possible that magnetic tracks would have been adopted by the film industry in 1928 had magnetic recording been available. Nevertheless, the choice of photographic, or optical sound as the standard medium was a particularly fortunate one. Optical sound was the best in the early days of the soundfilm, and it is the best now for single-channel sound. Optical sound is the least expensive and most convenient type of record for theatre-release prints. Most important of all, its quality remains consistently high in spite of the archaic reproducing equipment still doing service in thousands of theatres.

But Public Likes Stereo, too!

The advantage of magnetic tracks on theatre-release prints lies almost wholly in the province of multichannel stereophonic reproduction. Multichannel reproduction from subsonically biased optical tracks failed to make the grade; and a 4- or 6-track magnetic reproducing cluster is certainly less cumbersome than a soundhead containing four or six separate exciting lamps, optical tubes, and photoelectric cells!

Magnetic striping and recording of the prints is a relatively costly proposition, however; and even though the best magnetic reproduction has a frequency range of 10 octaves, compared to 8 octaves for optical sound, the quality of single-channel magnetic sound is not perceptibly better than that of optical sound. In fact, magnetic sound is sometimes worse, being somewhat weak in the extreme low-frequency end of the sound spectrum, and "peaky" in the high-frequency region. The result is too often sound that is "thin," "shrill," "harsh," "unnatural," etc.

Single-channel magnetic sound on motion-picture prints has therefore been relegated to the field of non-theatrical 16-mm and 8-mm movies, where it possesses several decided advantages. But **multichannel** magnetic sound is an entirely different matter.

When CinemaScope stereophonic sound was introduced in 1953, the public showed little interest in stereo. Since then, however, stereosound has ridden a popularity wave in the field of binaural phonograph records and stereophonic sound tapes for home use. This has increased the demand for stereophonic sound in the theatre.

In view of this demand, we cannot refrain from wondering why the great majority of movie producers have so neglected the CinemaScope magnetic-sound process. The magnetic reproducers in thousands of theatres remain idle most of the time. In their failure to utilize fully a stereosound system already at their disposal, all too many movie moguls are guilty of the shortsigtedness for which Hollywood is notorious.

By advocating wider use of magnetic stereosound for 35-mm motion pictures, however, we have in mind only those productions filmed in a widescreen process (preferably CinemaScope) and in natural color. Normal-format pictures, particularly those photographed in black-and-white, are undeniably better accompanied by single-channel optical sound. Stereosound would be distracting in such introspective normal-format photoplays as, for example, Ingmar Bergman's haunting 1958 film, "Wild Strawberries."

While recognizing the need for all **kinds** of pictures (isn't variety the lifeblood of the theatre?), we nevertheless make a distinction: and in making it we are heartily thankful that optical tracks have been retained for the single-

channel reproduction of motion-picture sound.

Photocell Defects Now Eliminated

The defects peculiar to optical recording and reproduction have been greatly minimized by technical improvements made from time to time over the years. The first big improvement was "noiseless recording." A light-biasing valve was added to the film recorder to darken or narrow the track during times of low volume or silence. By this stratagem no more light is admitted to the photoelectric cell than is necessary to reproduce the prevailing volume of sound.

Noiseless recording thus reduces the extraneous noise caused by scratches and dirt in the soundtrack area, and, more important, the hissing noise which is generated by conventional photoemissive photocells under the influence of light.

Photocell hiss has always been a problem in sound-on-film reproduction. It is caused by statistical variations in the number of electrons shot out from the light-sensitive photoemissive cathode of the photocell. And this is not the only disadvantage of conventional photoemissive cells. They require a "polarizing current" of about 90 volts potential to place a negative charge on the photoemissive cathode, they are destroyed by excessive voltage and by exposure to bright light, they slowly, but gradually, deteriorate with age, and the argon gas with which they are filled to increase sensitivity results in a serious attenuation of signal output at the high-frequency end of the sound spectrum.

All of these defects of conventional photocells are absent from the remarkable new phototransistors which have done much to raise the quality of optical sound to a gratifyingly high level.

Evolution of Phototransistors

It has been known for many years that the semi-metallic element selenium, a member of the sulfur family, conducts current several times better when exposed to light than it does in the dark. Selenium is, in fact, a light-sensitive resistor. Although the selenium **photoconductive cell** fails to respond to rapid fluctuations of light, making it useless for the high-fidelity reproduction of sound, another photoconductive substance called lead oxysulfide is ideally suited to sound-on-film reproduction, and has been widely used for this purpose with excellent results.

Photoconductive cells are not phototransistors, however. Phototransistors actually **generate** current when exposed to light, and hence were formerly called **photovoltaic cells.**

The article on transistors in last month's issue of IP told how negative electrons and positive "holes" are set in motion in a semiconductor, such as germanium, by applying a suitable "bias voltage" to the material. Now, light, another form of energy, can also set the electrons and "holes" in motion and generate a current!

A p-n diode, ordinarily used as a rectifier to change AC into DC, can thus actually function as a photovoltaic cell if it be properly designed for this special job.

So far as we know, the first phototransistor was made by Charles Fritts of England in 1883. Fritts coated a piece of selenium with a film of metal so thin as to be semitransparent. Still other photodiodes of early vintage employed copper coated very thinly with copper oxide. These voltage-generating photocells have been used in photographers' light meters for many years, and are still so used. Modern phototransistors are made of specially prepared germanium, silicon, indium antimonide, and other suitable semiconductors.

Silicon Photodiode Most Suitable

It is even possible to manufacture a germanium triode to work as a self-amplifying phototransistor when suitably biased with direct current! Such a device is electrically equivalent to a photoconductive cell, or to an ordinary photoemissive cell, except that the actual light-sensitive junction functions in a photovoltaic manner.

On the basis of data supplied by Texas Instruments, Inc. of Dallas, it appears to this writer that the silicon p-n junction photodiode is at least as serviceable and efficient as any other phototransistor currently available for motion-picture sound reproduction. This assertion is strongly supported by the well-proved characteristics of the T.I. LS223 and LS222 (miniature) silicon "light sensors," as these products are known in the trade.

The LS223 and LS222 photodiodes are a direct development of the "silicon solar battery" which made scientific headlines a few years ago, and which are often used for recharging the batteries on orbiting earth-satellites.

The solar battery converts light into electricity, and so does the p-n silicon photodiode, a highly refined device of great ruggedness, reliability, long life, and high-quality performance. It performs much better than the conventional photoemissive cell; and there is no "photocell hiss" when a phototransistor is used to convert the modulated exciting light into sound current.

Exclusive "Inside" Report to IP

The following exclusive report on the p-n silicon photodiode, kindly sent to the writer by an independent equipment engineer, is of special interest:

"Our organization has been test-sampling suitable conversion assemblies incorporating silicon light sensors at random installations among its theatre circuits for more than six months with results to date universally successful and encouraging in operational comparison with the replaced conventional photocells. While a variety of photodiodes are commercially available, the most suitable in physical form and adaptability to existing optical soundheads was the T.I. LS223 in a metal header encapsulation with the "end-on" sensitive area protected by a rectangular glass window. . . .

"As the initial unit cost of the LS223 sensor procured in small lots approximates that of three conventional photocells of the type replaced, the real cost can be evaluated properly only in terms of service life and performance reliability. Our continuing around-the-clock test employing a cycled chopper-modulated light source activating a representative LS223 sensor has to date exceeded 3,000 hours of daily monitored signal output with no significant deviation from that established at the beginning of the test.

"Considerable encouragement is provided by the fact that the majority of the first sensors to be manufactured remain capable of performing today fully as well as when new several years ago. This leads us to the conclusion that, once installed, **a silicon photodiode may well outlast virtually all the associated components of a theatre sound system.**

"Bonus economy is also attainable in that the supply power to the soundhead exciter lamps can be reduced well below nominal lamp ratings (e.g., the 10-volt, 5-ampere exciters are operated at 6 volts in the soundheads modified by us for the use of silicon photodiodes). This yields a lamp filament life increase as much as ten times the average span at full voltage rating, and consequently also reduces envelope blackening and surround-parts heating. . . .

"To those of the motion-picture industry who remain strong supporters of the relative simplicity and economic advantages of photographically recorded soundtracks over the magnetic type, the photovoltaic silicon light sensor appears to hold great promise in narrowing the margin heretofore tending to favor the magnetic medium from technical considerations. The improvement resulting from using light sensors (phototransistors of the p-n silicon photodiode class) for increased

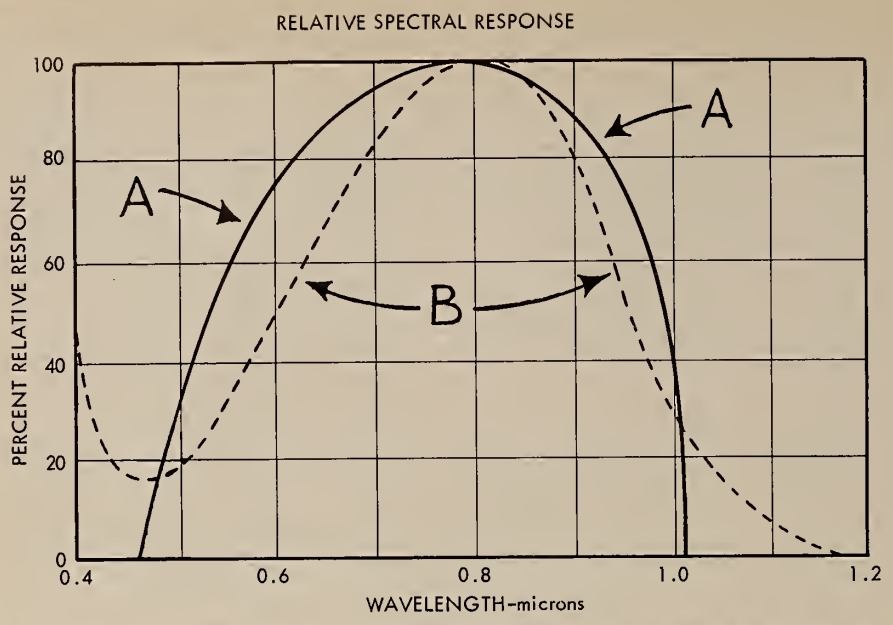


FIG. 1 — Spectral response of LS222 and LS223 silicon photodiodes (solid line, A) and conventional cesium-oxygen-silver photoemissive cells (dashed line, B). These two response curves are surprisingly similar; and each has a maximum-response peak at 800 millimicrons in the near infrared. (The visible spectrum extends from 400 millimicrons (violet) to about 750 millimicrons (red).)

frequency and dynamic ranges would, of course, necessitate higher printing standards for 35-mm optical release prints."

Spectral Response of Silicon Diode

The spectral response of silicon phototransistors is very similar to that of the conventional photoelectric cell having what is called an "S-1" spectral response. That is, both the conventional photocell and the silicon diode respond mainly to orange, red, and infared wavelengths of radiation, as indicated by Fig. 1. The upper and lower cutoffs of the silicon photodiode are rather sharper, however, and occur at 460 millimicrons in the blue and at 1000 millimicrons in the infrared.

Because the two curves shown in Fig. 1 are so similar, and also because both of them peak at 800 millimicrons in the near infrared, a soundhead optical tube achromatized and properly focused for optimum performance with an ordinary S-1 photoemissive cell is perfect for use with T.I. LS222 and LS223 p-n silicon phototransistors.

Other types of spectral response curves are obtainable with other semiconductor materials. For example, an indium antimonide photodiode peaks at about 3500 millimicrons in the infrared. This phototransistor, like the lead oxysulfide photoconductive cell, requires special chromatic correction of the sound optical lenses for maximum frequency response, and cannot be accurately focused by such visual methods as the well-known "flicker test" used by many projectionists. (See "Mitchell's Manual of Practical Projection," p. 359, for a description of the flicker test for optical-tube focus.)

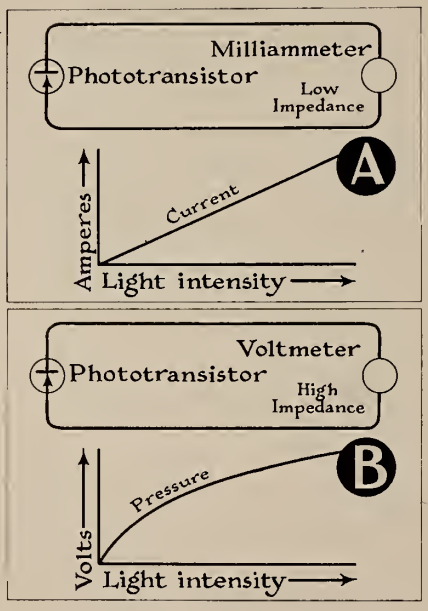


FIG. 2 — In order to respond in a "linear" manner to increasing intensities of illumination, a p-n silicon phototransistor should be operated against a low-impedance load resistor, as in A. This is called "short-circuit operation," and provides undistorted sound response with the output current faithfully duplicating the fluctuations of the soundtrack-modulated exciting light. The non-linear logarithmic response resulting from the high-impedance "open-circuit operation" depicted in B is useful for certain relay circuits, but not for movie sound reproduction.

Phototransistor Circuitry

There are two ways of connecting a p-n silicon phototransistor to an electrical circuit; and only one of these is correct for a motion-picture amplifier system. These two ways are distinguished from each other by the ohmic value of the "load impedance" shunted across the two terminals of the silicon photodiode.

If the impedance be high (several thousand ohms to a megohm), the photodiode works under "open-circuit" conditions and responds in a logarithmic manner to increasing light intensities, as in Fig. 2B. Because this type of operation distorts the sound, it should not be employed for sound reproduction even though there are other valuable uses for it.

In order to give a perfectly linear response to increasing light intensities, the silicon photodiode must be loaded by a low impedance to approximate "short-circuit" conditions, as shown in Fig. 2A. The ohmic value of this impedance should be somewhere between 600 and 800 ohms for optimum results. Used with a standard load resistor of 750 ohms, for example, the silicon diode gives a linear response and undistorted sound with a cell output of about 25 microamperes at 20 cycles, 21 microamps. at 10,000 cycles.

Fig. 3 gives the circuitry of a suitable n-p-n germanium transistor preamplifier for the T.I. LS222 p-n silicon photodiode. Note the 750-ohm load resistor connected across the photodiode for short-circuit operation and the 50 microfared input-coupling capacitor to isolate the photodiode from the 25 volts of direct current used for base-biasing the preamplifier 2N332 transistor.

The output of this preamplifier has an impedance of 100,000 ohms for direct connection to the input of a tube-type power amplifier. Output is remarkably level over the frequency range from 20 cycles per second (1.8 volts) to 10,000 c/s (1.2 volts). Output varies less than 1 db for the widest range of temperatures likely to be encountered in projection-room practice.

This remarkably stable and satisfactory all-transistor system has an indefinitely long life (no replacement parts may ever be needed), and can be made so compact that the whole preamplifier may be mounted in one small corner of any soundhead. Indeed, the miniaturization and circuit simplifications made possible by transistors should in-

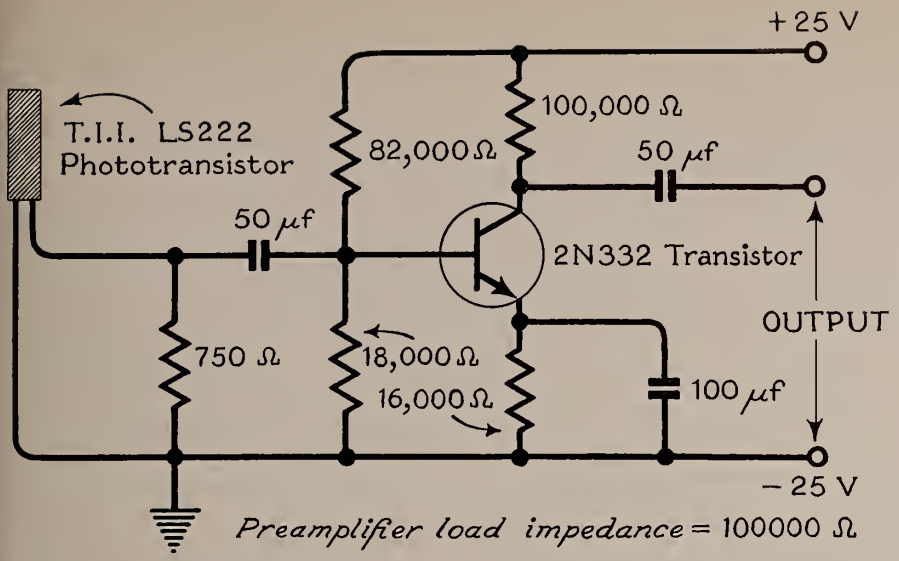


FIG. 3 — A transistorized preamplifier circuit connected to a p-n silicon junction photodiode. The output from this voltage-gain amplifier may be fed directly to the power-gain amplifier which drives the loudspeakers. See text for details.

spire equipment manufacturers to produce a corresponding simplification of the mechanical design of the optical sound reproducer, itself, and eliminate the heavy, bulky separate soundhead assembly from 35-mm projectors.

Design experience in the 16-mm field proves that a compact optical-sound "takeoff drum" in the picture mechanism is desirable and entirely feasible. A similar simplification of 35-mm projector design may soon be demanded by astute purchasers of theatre equipment. And, of course, both phototransistors and transistorized sound amplifiers will be prerequisite. **iP**

306 Boosts Bargaining Status with Absorption of Indie Union Members

NEW YORK — Local 306 increased its bargaining position when, on Jan. 11, it absorbed members of the Independent Motion Picture Machine Operators & Television Employees Inc., which was dissolved by member action.

The fusion gives 306 jurisdiction over 99% of the more than 400 theatres in the New York area (which includes Manhattan, Bronx, Brooklyn, Queens and Staten Island), in addition to projectionists and maintenance and service men at studios, screening rooms and television station WPIX. The IATSE local now has more than 1,600 members.

Negotiations between the two unions have been going on for three years, according to Ernest Lang, secretary of 306, speaking for the administration, and also Steve D'Inzillo and Harry Garfman, respectively business agents for New York and Brooklyn, who were active in the negotiations.

At least three important contracts with New York circuits will expire in the early summer this year. They are the RKO Theatres, Loew's Theatres, and the Independent Theatre Owners. The two former contracts expire in May and the latter in June.

Members of the IMPMO&TE, headed by Charles Axelrod, voted to dissolve their union and be absorbed as members of 306 Jan. 10. The independent union was formed in 1940 and had been operating under a New York charter since 1950. It recently had contracts with over 25 theatres.

This is the third fusion of members of other unions by 306 in nine years. In 1943 the IATSE local absorbed members of the Empire State, and in 1947 the Allied union's members became members of 306. **iP**

CAMPAIGN FOR MEDICARE

NEW YORK — The 25-30 Club has a vigorous campaign on for its members and their relatives to write President Kennedy and Secretary of Health, Education and Welfare Abraham Ribicoff in support of medical care for the aged through social security. The club's monthly meetings and the official bulletin urge members to write now, while Congress is in session. **iP**

Club Warns of Battle Of Automation vs. Men

NEW YORK — Stern warnings about the developments for automated theatre projection featured the Feb. 8 meeting of the 25-30 Club.

Jack Winick's remarks about the threat to livelihood for projectionists posed by automated machines sparked the discussion. He referred to the English theatres who have automated projection now in some of their cinemas, the self-threading 16mm projector (which he said "if they can do that with 16mm, they can do it with 35mm"), and said he would put up the "fight of his life" when a machine took his projectionist job away.

Other speakers, including president Arthur Silverman and past president Harry Mackler, warned members that they had to gird for the battle of the machines vs. men.

Vice president Joseph Klienman took the president's chair while the new president, Silverman, acted as recording secretary in the absence of Morris J. Rotker, who was resting at home for forthcoming surgery. Jack Krimon, financial secretary, drew applause when he read his report showing the Club had over $12,000 in the kitty.

Mrs. Gertrude Lichenstein, widow of one of the founders of the club, was a guest at the meeting from her home in Florida. Dick Cancellare, president of Local 306 and a member of the club, was host to refreshments following the meeting. **iP**

Gratis Equipment For Non-Profit Groups

NEW YORK — Florman & Babb, Inc., announces the opening of its large stocks of surplus motion picture equipment to such non-profit institutions as universities, high schools, religious and philanthropic organizations. These stocks include motion picture cameras, gun cameras, aerial cameras, lenses, film magazines, filters, wire sound recorders and supplies of wire, master recording discs, tripods, rewinds and hundreds of other varieties of equipment.

This equipment is offered free of charge to non-profit institutions. Interested organizations are requested to mail their listings of equipment requirements to Florman & Babb, Inc., 68 W. 45th Street, New York, N.Y., attention Charles Lipow. This free offer will remain in effect until these surplus stocks are depleted, and Florman & Babb, Inc. reserves the right to service requests for equipment on a "first come, first serve" basis. **iP**

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Screen Is Fourth Wall of Paris Theatre

PARIS, FRANCE — The remodeled and renamed Empire-Abel Gance theatre here, set up for Super-Cinerama, has a huge screen acting as the entire fourth wall of the theatre. It is 108 ft. wide and 36 ft. high, running from floor-to-ceiling and wall-to-wall.

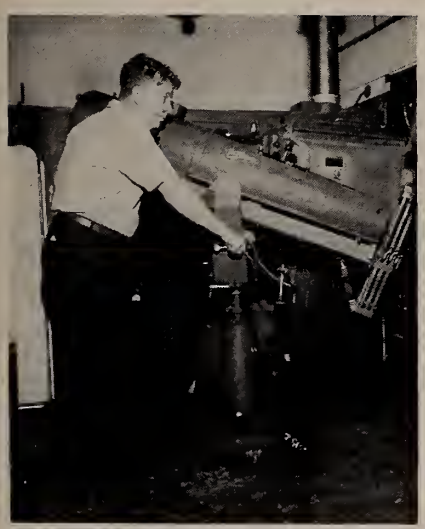
The old Empire Theatre was renamed in honor of the famed French movie director.

The threatre audience reachs its seats by means of a series of escalators running up to the orchestra level. In the lobby, which features a magnificent modern decor in red, gray, black and orange, is a huge 15-foot bronzed chandelier. One feature of the theatre which should appeal to world-wide audiences is serving bars on every level of the theatre. On the main orchestra level, one bar serves only Scotch, while another serves only champagne!

Another unique feature of the theatre interior is that, following the plans for Super-Cinerama houses, it is furnished entirely in one color! The seats, walls, floor covering and even the curtain covering the world's largest screen are all of the same color, a pleasant rust shade. The seats themselves are extra-wide and covered in real leather, while the curtains are of antique watered silk.

The new theatre will show only Cinerama films. The gala opening night audience saw "Windjammer" in Cinerama; also shown was a trailer for the first storyline Cinerama film, "How the West Was Won," scheduled for release this year.

Nicolas Reisini, president of Cinarama, Inc., in Paris for the opening, explained how the theatre got its name. "I saw a movie here in Paris in 1927 called 'Napoleon,' made by a director named Abel Gance. It was filmed by using three motion picture cameras simultaneously in tandem and it produced the sensational wide-screen effect we have today. I never forgot the impact this had on me. From that moment on, I realized the future of the motion picture industry lay in using such a wide-screen process. It has taken Hollywood 25 years to realize that the genius who made that film, Monsieur Abel Gance, had the right idea. Awarding him the 'Prix International Cinerama' and naming this theatre for him is but belated recognition of his enormous contribution to film-making." **iP**



SPOTLIGHTS — That the booking of live attractions along with pictures is a trend with theatres today is evident in the increasing number of theatres installing follow spotlights. Shown is an installation of a Strong Trouper Arc spot in the Frontier Theatre, Hobbs, New Mexico. Literature on this type of equipment will be sent to any reader requesting it from the Strong Electric Corp., 10 City Park Avenue, Toledo 1, Ohio.



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Projectionist Profile

Dick Cancellare, 306 President, Is Proud to Be an Organization Man



Dick Cancellare

An organization man, and very proud of it, Dick Cancellare, serving his second two-year term as president of IATSE Local 306, New York, proves it by his very evident dedication to his local, his 7-year service as a member of the Selective Service Draft Board in Kings County (by appointment of the President of the United States), and when he enthusiastically refers to his Navy experience in World War I.

Dick, who has been a projectionist for more than 40 years, is not a talkative man in the sense that he sticks to the facts he knows, and is wary of giving his personal opinion about such conversation pieces as the state of the union, the world situation and such. However, in an interview with your IP correspondent, Mr. Cancellare guardedly said he looks forward to 1962 as being a good year for the movies — "producers are coming up with high quality pictures and television viewers are reported to be getting more selective about shows on the air."

Cancellare has been with 20th Century-Fox as projectionist at the home headquarters in New York since 1926. The rest of his career as a projectionist was with theatres in Brooklyn and New York City. A native New Yorker, Cancellare now lives in Lynbrook, L.I., after having lived in Brooklyn where he was active in the community.

He became a member of 306 in 1922, sometime after he was honorably discharged from the Navy, and for years he served on the local's executive board. Prior to 1959, when Dick was elected president of 306, that office had a full-salaried full-time president, though presidential functions and duties remain the same as always with that post.

It's apparent when he talks about his duties to 306 that Cancellare is a fair-minded man, resolving local problems, he digs for facts in the individual case. "I don't let my personal sentiments intrude or sway my decision when, say, a member is on the carpet for any infraction of his duties on his job or breaking regulations, or any other problems of the local's affairs."

When he was a board member of the Selective Service Draft Board, No. 157 in Kings County had a high reputation for minimum reversals of draftees selected when it came to appeals.

Cancellare served as a first-class seaman, with a gunners rating on the USS Huntington, formerly the USS West Virginia. He likes to reminisce about his "happy days in the Navy." He was athletic in his New York boyhood — at any rate he was picked as the sparring partner of the Huntington's champ boxer. Even this jolting and bruising chore in his spare time from duty aboard the old battle wagon is recalled with joy by Dick.

When he was showing a newsreel to 20th-Fox executives, he blurted from the booth, when a clip of film showed the new USS West Virginia, "I served on the old West Virginia in World War I." An executive stopped by when the newsreel showing was over and told Dick to come to his office, where the executive said he had served on the Huntington and there was a renewal of acquaintance of the former Navy buddies.

Dick Cancellare has taken on spare time duties, in addition to his work for 20th-Fox, as president of Local 306. He gets out of bed mornings at 6:30 to catch the train from Lynbrook to New York for his tour at the screening rooms at 56th Street near 9th Avenue. (If he's lucky he gets the 6:15 p.m. train to Lynbrook.) **iP**

Concellare Reelected Prexy of IATSE 306

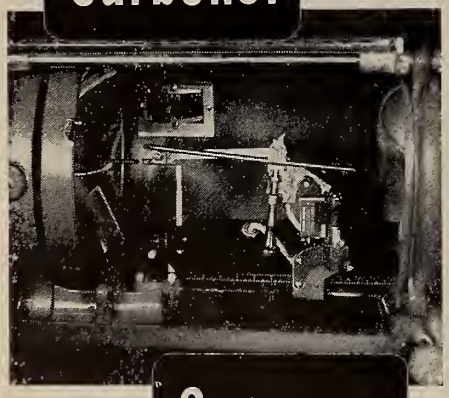
NEW YORK — Richard (Dick) Cancellare was reelected president of IATSE Local 306 Moving Picture Machine Operators at the recent election. Peter Capone succeeds Al Runk as vice president. All other officers, in addition to Cancellare, were reelected.

Serving another term are: Ernest Lang, recording secretary; Isidore Schwartz, financial secretary; Abe Kessler, treasurer; Steve D'Inzillo, New York business agent; Harry Garfman, Brooklyn-Queens business agent; Irving J. Meltzer, sergeant-at-arms.

Newly elected members of the executive board: Dave Garden and Sol Kirschenbaum join Al Ashman, Sam Salvino, Herman Boritz, Sol Gable, Frank Inciardi, Max Kessler, Frank E. Miller, and Tony Rugino who continue as members of this board.

Al Sprung, Herman Stoller and Ben Stern were reelected to the board of trustees. **iP**

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iP AUDIO - VISUAL

8mm Boom In Educational And TV News Reel Fields

NEW YORK — Manufacturers of cameras, projectors and film stock predict that 8mm sound prints are on the threshold of sensational growth in the educational and also the TV news field.

Last fall's prediction at the SMPTE convention that by 1970 the potential market for 8mm teaching machines would reach 750 million dollars wasn't challenged then or now.

Most of the lower cost of 8mm vis-a-vis 16mm is in processing the film. In 1962 General Film Laboratories, Hollywood, announced availability of 8mm sound prints at one-half the cost of 16mm prints. The company developed a technique to handle four times the number of frames by their new 35-32 printing method for 8mm. Fred J. Scobey of General said he looked forward to 8mm sound prints at one-quarter the cost of 16mm.

Manufacturers of film stock are not worried by the development of 8mm in the educational field because there will be a burgeoning of camera work by teachers and even by students. John Flory of Kodak, reading a paper prepared by Louis Forsdale for the convention, cited that one school system is placing 8mm cameras at the disposal of teachers to film field trips to which students will add their own sound narration. He added the potential of locally-made science films, for instance the geology of the immediate countryside.

At that same convention two representatives of Ramo-Woldridge's Training and Simulation Department, detailed the requirements of an ideal 8mm projector for use in teaching. They said in addition to low cost and simple loading, one most important requirement would be a "film search" means whereby the user could jump many frames forward or backward to frame position dictated by the learning situation.

A general manager of a television station at that same meeting pointed out that in all areas of cost, including personnel, the 8mm technique has resulted in something "over 50 percent savings in the cost of our TV newsreel work." **iP**

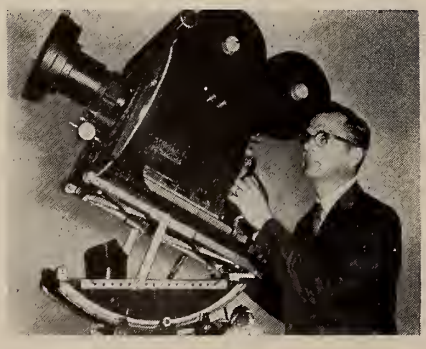
New Camera, Other Developments Lead Cinerama into Seattle Fair

A wide angle 70mm camera, designed and manufactured by Benson-Lehner Corp., Santa Monica, Calif., has been delivered to Cinerama, Inc., and has successfully passed its qualification tests, Guy H. Hearon, vice president, photo instruments division, has announced.

Produced by Benson-Lehner under contract from Cinerama, the camera and a Benson-Lehner projector (soon to be delivered) enables the first commercial use of full format 70mm film. The camera is used with a wide angle lens providing 160 degree field of vision in any place.

The new Benson-Lehner camera and projector will make possible the latest cinematic innovation developed by Cinerama, to be unveiled in Seattle at the Century 21 Exposition Spacearium starting April 21, 1962.

Sponsored as a joint venture by Cinerama, the Boeing Co., and the U. S.



Science Exhibit of the U.S. Dept. of Commerce, Cinerama's Spacearium will display a unique 12-minute space voyage film being produced by Cinerama. Photographed and projected by the new Benson-Lehner equipment, the film will be viewed by an estimated 6 million attendees at the Exposition.

The film will be projected onto a 75-foot diameter, 8,000 sq. ft. hemispherical screen that will put the viewer completely into the environment of the screened picture, says William D. Liittschwager, Spacearium program manager. **iP**

IATSE Convenes in Las Vegas Sept. 10

NEW YORK — The 46th Convention of the International Alliance of Theatrical Stage Employes and Moving Picture Machine Operators of U.S. and Canada, will be held at Las Vegas, Nev., the week of Monday, Sept. 10, it was announced by Richard F. Walsh, president.

In attending the 1962 Convention at Las Vegas, delegates will have an opportunity to inspect one of the country's outstanding entertainment centers, Walsh said. The number of members of the Alliance employed there — along with actors, musicians and members of other entertainment crafts — has increased rapidly in recent years. Special staging techniques have been devised to handle the type of productions which the various hotels present. **iP**

Plans Progress for Movie Museum

LOS ANGELES—As plans progress for the building of the Los Angeles County-Hollywood Motion Picture and Television Museum, 19 IA members are helping make this dream come true.

International President Richard F. Walsh and Arthur C. Ciller of Cameramen's Local 659 are serving on the Advisory Council.

International Representative George J. Flaherty is a member of the Museum Commission.

On the Sound and Electronics Committee are three members of Sound Technicians Local 695: Robert O. Cook, George R. Groves and Gordon Sawyer.

(Financing of the Museum is being undertaken jointly by the Los Angeles County Board of Supervisors and a group of industry volunteers, the Hollywood Museum Associates. The Associates are headed by producer Sol Lesser.)

By early Spring, 1963, Hollywood will have a show place to display the monumental achievements that have made it the entertainment capital of the world. **iP**

"PACIFIC PANORAMA"

by Hank Boldizsar

It is indeed very nice to be back on the pages of IP after an absence that for this writer has been much too long.

We offer our services and our column to all motion picture projectionists as a medium for cementing good will among the members of our craft by getting to know each other just a little bit better.

From time to time we shall travel along the coast visiting you in your projection rooms and Union Locals. Look for us, we'll be coming your way for IP magazine.

Incidentally, we sold the old homestead in Montebello and moved to a new traffic jam, a beautifully taxed area called La Mirada where 11715 Broadfield Drive, Whittier, Calif. is the mailing address. We do hope we'll be hearing from you. Your opinions and criticisms are greatly appreciated. H.B.

Like most projectionists, I am fascinated by the newest in projection equipment and in the past I have concentrated much of my "news-pounding" to bringing you information on new additions to the craft and the people responsible for operating them. We will, of course, continue to do so, but in all fairness to those "unsung heroes" of the craft, projectionists such as Cecil Helman and Ace Nunn, let's deviate a bit from the sublime and dwell a bit on the ridiculous equipment with which some exhibitors expect "our boys" to run a show.

There really is no point in mentioning the particular theatres involved, but in our travels we found that Cecil and Ace are struck with two of the worst conditions in our L.A. area. Keeping the show running night after night requires a great deal of mechanical skill and technical know-how and fortunately, for the management, these two men are abundantly blessed with both.

Museum pieces operated by these men should be retired to the motion picture "hall of fame." They were new about the time this writer graduated from rubber pants.

I stopped by the booth one night to chat a spell with Cecil and found him fit to be tied. It was build-up night and the rewind was about to depart this earth. The old standard Simplex's and "U"-bases kick up such a fuss that a man's nerves soon reach the breaking point and getting a relief man to work this booth is a real chore. Cecil had been operating more than a week on his emergency power supplies for sound and light.

We would at this point like to tell you how these men conquer their problems in the booth, but unfortunately their only hope is that someday soon the "boss man" will stop painting the box office and front doors and give Luis Wutke and Mickey Solomon the green light for refurbishing the projection rooms.

(Oh — my gosh!!! I just looked up "refurbish" in my dictionary and for an example of word usage it offers "the theatre **lobby** was fully refurbished." I guess you just can't win.)

• • •

Our success story for the month concerns our very good friend and most able projectionist, Neal Edwards (formerly of the Garmar Theatre, Montebello). Having completed his studies at the University of Southern California and after a brief association with a Los Angeles firm of accountants, Neal, now a CPA, was recently appointed comptroller for the new Beverly Community Hospital in Montebello. Quite a loss for our Union Local (150) but a very big step forward for a very fine young man — the guy that's going to shoot me if I don't return his book on Labor Law soon.

• • •

Our invention of the month comes from the busiest projectionist in the entire USA — our own Nels Matheson, who has developed what he calls the Eureka Torque Grip Carbon Clamp. This little gem, and we have looked and we like, is spring loaded and virtually puts an end to cracked positive carbons due to the vise-like grip that screw type clamps exert on the carbon. We predict the projectionists who use



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About Hank Boldizsar . .

A projectionist since 1940, and a member of Union Local 150, Los Angles Theatre Projectionists, H. E.



"Hank" Boldizsar

"Hank" Boldizsar, in addition to his projection activities is engaged in electronics research and development with Autonetics—a division of North American Aviation, and attends evening classes at Cerritos College for engineering design.

Born in Detroit, his wife, Roberta, and he have two sons—Terry, 15, and Gary, 12. He served in Army Signal Corps for over three years in World War II, with 42 months in the ETO. His hobbies are writing, travel, fishing and boating in the family's 16 foot craft, the "Vind-Yammer."

---

this new development will swear by it.

IP readers will remember Nels as the power-house behind the West Coast copper salvage drive for the benefit of our Will Rogers Memorial Hospital. This very fine project is still being pushed and Local 165—Hollywood Studio Projectionists is leading the field, Nels reports. The studio boys have doubled and redoubled their interest and effort. It is our wish that all projectionists would lend a helping hand for the benefit of our less fortunate brother craftsmen and all employees of the entertainment industry. Mutual benefit is one of the finest functions of Organized Labor.

• • •

The recent holocaust in the Hollywood Hills resulted in a tremendous loss for the Los Angeles area. Newspapers throughout the nation covered the tragedy, but failed to mention that the home of Wallace "Wally" Crowley (former president of Local 150 and now chairman of the pension committee) was damaged by the borate bombs. To our knowledge, Wally is the only craft member hurt by the fire—fortunately, his home was not destroyed.

iP

New Strong Rectifier Serves as Power Supply For 2 Projection Lamps

TOLEDO, OHIO—A new type silicon stack transformer-rectifier designed as a power source for the operation of two projection arc lamps has just been announced by Arthur J. Hatch, president of the Strong Electric Corp. No flicker or other change in screen light is noticeable at the time of striking the arc or making changeovers.

Employing two silicon stack assemblies, one for each output, the unit is said to afford much greater efficiency than selenium rectifiers and previously developed silicon types.

Known as the Bi-Powr, the first equipment in this new line has a dual output rating of 90-135/90-135 amperes at 56-70 volts D.C. It is designed for operation on 220 V. 50/60 cycle, three-phase A.C.

The novel "LO-Strike" feature associated with each output protects the silicon stacks from overload and prevents the destruction of carbon crater upon striking the arc. The strike is said to be so gentle that it is impossible to detect on the screen when the incoming arc is struck. An exclusive automatic reset permits immediate restriking in the event that the arc is not established the first time.

A choke in the direct current output circuit makes for quiet operation and holds ripple to less than 3%.

Built for extremely long life, the silicon stacks are down draft fan cooled and the transformer is Class H glass insulated.

The Bi-Powr, weighing 301 lbs., is extremely compact, requiring one-third to one-half less floor space than other



equipment of comparable power rating.

Literature will be sent to anyone addressing a request to the Strong Electric Corp., 10 City Park Avenue, Toledo 1, Ohio, mentioning International Projectionist. **iP**

HARVEY SEARS, 63, DIES

NEW YORK—Harvey Sears, 63, a motion picture projectionist for 40 years, died here Feb. 7. Long a member of Local 306, at the time of his death he was financial secretary of the Projectionists Square Club, and a member of the 25-30 Club. **iP**

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LETTERS . . . to the editor

TRIBUTE TO SMPTE

An extended absence from my office on a business trip has prevented me from writing to you at an earlier date to express how pleased I was to read the splendid tribute to the SMPTE which you carried in your editorial column "Monthly Chat" in the November issue of the International Projectionist.

In reading this editorial, I was much impressed, not only with the thoughtful approach which you had taken in describing the position of our society in its relation to the motion picture industry, but also in the able manner in which you described and evaluated the nature of the engineering support which we have and are striving to render.

Speaking both personally and on behalf of our society, I wish to thank you for the assistance you have given in publication of this most informative article.

J. W. SERVIES
President

Mylar Splice Source

EDITOR, IP:

I'd appreciate knowing where I can buy the perforated Mylar tape used for splicing 35-mm film without the use of film cement. A sample of a taped slice is enclosed.

MORRIS H. THACKER
Local 110, IATSE
Chicago, Illinois

EDITOR'S REPLY:

One of the sources of 35-mm Mylar splicing tape nearest your address is:

The Harwald Company, Inc.
1245 Chicago Avenue
Evanston, Illinois

Since Mylar tape is supplied in two colors, orange and clear, you should specify the clear. It is priced at $9.00 per 66-foot roll. Splicing blocks for the accurate application of the tape are inexpensive. Other suppliers are:

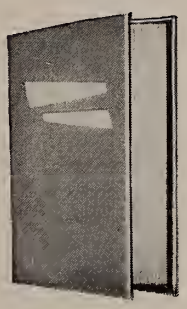
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ELECTRICAL NOISE

270 pages, 6 x 9
105 illustrations
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By WILLIAM R. BENNETT
Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
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3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
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Knowledge of Equations, Ratios Helps in Projection Room – Here's How to Use Them

BY JOSEPH HOLT
Member, IATSE Local 428

Recently we detailed a method by which lens focal lengths might be computed by the simple multiplication of the Cinemascope prime lens by a given factor. Our purpose had been merely to render the job as easy as possible, but we have since learned that there is some confusion in the minds of projectionists who may not have handled any problem more complex than the computing of payrolls for the projection room in a good many years.

This article will attempt to detail how easy it is to use simple equations and ratios in the calculation of various problems encountered in the projection room.

Consider this statement: $\frac{1}{2}=\frac{3}{6}$.

What we have actually said, is this: "If 1 be divided by 2, the same answer is obtained as when 3 is divided by 6."

This is a simple enough condition, but it is surprising to consider that all problems wherein three of four factors are a known quantity, we may readily obtain the fourth.

The easiest way to do this is the substance of this paper.

Let it be assumed that we did not know the quantity of 6 in the example cited. We might have written it $\frac{1}{2}=3/X$.

To solve this type of statement, it is necessary only to multiply the bottom quantity by the top quantity on the opposite side of the = sign. In the example given, we would obtain the following: 1X=6 (1 times X=2 times 3). Thus it is easy to see that the unkown quantity is 6.

Another way of writing this would be 1:2=3:X, which is read "one is to two as three is to X", and we have the simple statement of a **ratio.**

Let it be supposed then, that we have something like the following: 2:8=6:X. To solve this type of statement, we must multiply the two quantities on the end (called the **extremes)** and the two figures in the center (called the **means).**

In this example, we would then multiply 2 by X, and set down the result, 2X. Then to complete our job, we multiply 6 by 8, and obtain 48. Our next step is then to write "2X=48". We then divide the quantity on the right hand side of the = sign by the figure which precedes X. In this case, 48 divided by 2 gives us an answer which tells us X=24.

We can test this simple example by writing $\frac{2}{8}=\frac{6}{24}$.

Naturally, we know that $\frac{2}{8}=\frac{1}{4}$, as does $\frac{6}{24}$, but we can check problems which are not readily ob-

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One of the most attractive motion picture auditoriums in the United States, and one of the newest, is the McCormick Place Theatre in Chicago's new lakeside convention center. Prominently featured in the house for live shows and lighting work are Super-Trouper spotlights made by the Strong Electric Co., Toledo. One is shown at the left above.

vious, by the use of friend "cross multiplication. Two times 24 is 48, and so is 6 times 8.

It is hoped that our readers who are completely familiar with the basic procedure with which we have dealt will overlook our attention to what may see elementary. It must be recognized, as we said in the beginning, that many projectionists have not had reason to use this information for some time, and we believe it can be useful in many instances.

With the knowledge covered in this paper, we are prepared to calculate precisely a given lens focal length. Let it be given that we wish to know the nearest lens focal length for an aspect ratio of 1.75 to 1. Incidentally, this ratio would be set up as follows: 1.75/X= .825/X.

The "cross-multiplication" step would produce the results as set forth here: We find by dividing .825 by 1.75 that the vertical dimention of the 1.75 to 1 aperature must be .471".

Now, if Cinemascope pictures are projected with a 5.25" lens, we would set up our ratio thus: .715" (Cinemascope aperture dimension) is to .471" (1.75 to 1 aperture vertical dimension) as 5.25" is to X. This would be written .715:-.471=5.25: X. Multiplying means and extremes, we obtain .715 X =2.47275. When we divide 2.47 by .715 the answer is 3.45, which would indicate a preferred lens focal length of 3.5". It might be necessary to file the .471" aperture slightly, but we very likely would obtain the desired aspect ratio with a minimum of fumbling and correction. This is but one instance of the use of ratios in the projection room, and we hope the easy way to compute ratios will prove of value to others in the future. **iP**



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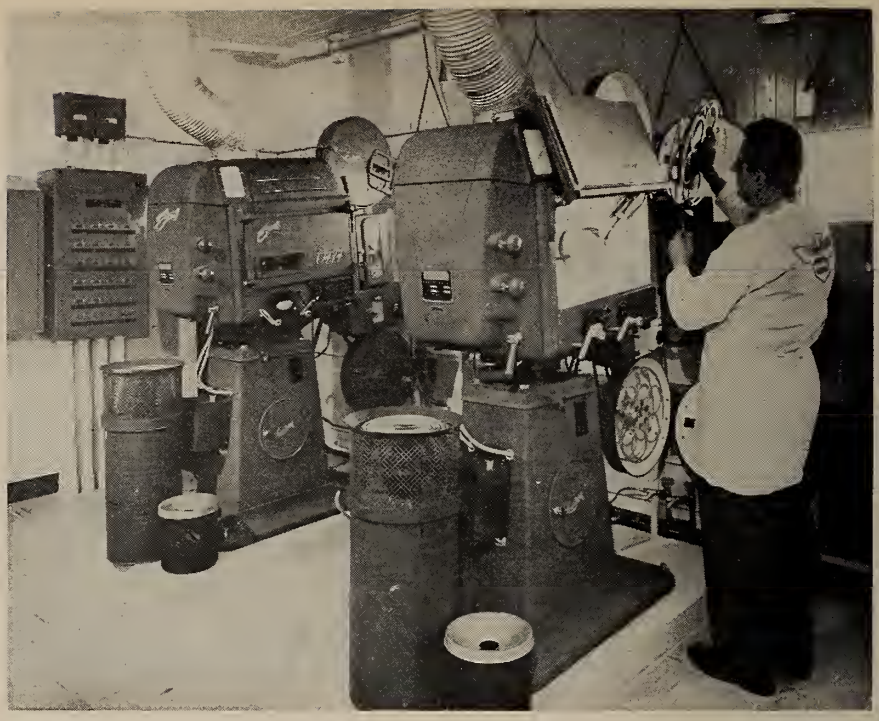
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SPARKLING NEW — It was a well planned, orderly projection room that greeted Paul C. Ladas, projectionist at the recently opened Thunderbird Drive-In Theatre at Glendale, Ariz., just outside of Phoenix. The equipment, which included Strong U-H-I arc lamps, was installed by John P. Filbert, Co., Inc., Los Angeles. Literature on this type of equipment will be sent to any reader addressing a request to The Strong Electric Corp., 10 City Park Avenue, Toledo 1, Ohio.

Back Issues, Anyone?

The editors of INTERNATIONAL PROJECTIONIST have received a number of inquiries recently for back issues of the magazine. We have been unable to fill many of these and it has occurred to us that many of our loyal subscribers may have accumulations which they no longer need. If so, we will be glad to act as a "clearing house" bringing together those who want and those who have back numbers. The requests are usually for "runs," or consecutive issues covering periods of a year or more. DO NOT SEND us the magazines, but supply us with lists of what you have available. We will transmit this information to those wanting back numbers. Price and terms are a matter for negotiation between buyer and seller. The editors of Intrenational Projectionist assume no responsibility for such transactions, we merely offer our services to bring together the "haves" and the "have nots." There is, of course, NO charge by IP for this service.

SMPTE Plans 1962 Los Angeles Convention

LOS ANGELES — The 91st Convention and Equipment Exhibit, to be held at the Ambassador Hotel, Los Angeles, April 29 to May 4, will probably be a record-breaker. Two years have gone by since the SMPTE had its last convention in LA.

The Equipment Exhibit, which will be more than twice as large as at the last LA Convention, will be a great attraction.

Seven of the society's engineering committees have installed new chairmen for the two-year term of office starting January 1962. These are:

Color Committee — Chairman: Dr. L. M. Dearing, 11955 Lockridge Rd., Studio City, Calif.

Film Dimensions Committee — Chairman: Dr. W. C. Brandsma, Photo Products Dept., E. I. du Pont de Nemours & Co., Parlin, N.J.

Film Projection Practice Committee — Chairman: C. E. Heppberger, National Carbon Co., 230 N. Michigan Ave., Chicago 1, Ill.

Laboratory Practice Committee — Chairman: W. D. Hedden, Calvin Productions, Inc., 1105 Truman Rd., Kansas City 6, Mo.

Standards Committee — Chairman: G. A. Chambers, Eastman Kodak Co., 343 State St., Rochester 4, N.Y.

Television Studio Lighting Committee — Chairman: R. G. Williams, Century Lighting, Inc., 521 West 43 St., New York 36.

Video-Tape Recording Committee — Chairman: A. H. Lind, Radio Corp. of America, Bldg. 10-3, Camden 2, N.J.

iP

NEW FEATURES

TOLEDO, OHIO — A "cold" type reflector and a design change which permits changing the plane convex lens, without removing the lens mechanism housing, are new features of the 1962 model Universal Arc slide projector, which burns a 7-mm carbon trim, it has been announced by the Strong Electric Corp., 10 City Park Ave., Toledo 1, Ohio. **iP**

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Today, topping the line of six lamps for drive-ins and eight for indoor theatres, is the Jetarc, most powerful projection lamp produced to date, with a light output twice that of any other lamp.

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WRITE FOR LITERATURE

THE *Strong* ELECTRIC CORPORATION

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Volume 37 March, 1962 No. 3

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U.S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

IT'S DIFFERENT THESE DAYS

Old-time supply dealers around the country say they miss the old days when projectionists frequently visited their stores.

With one collective voice their plaint is that in these new days of film business they rarely see theatre machine operators in their shops.

"When I started this business," said one dealer (and he reflected the sentiments of many veteran supply store owners) "we had the pleasure of seeing projectionists, working in theatres around the area, coming into our shop and asking if we had anything new. And if we hadn't anything new to show them, they would chat a while about the machines we were displaying or talk a bit about the equipment they were working with on their job.

"I miss those contacts with the craftsman who appreciated the good points — and pointed out the 'bugs' — in the present models of projectors, arc lamps, even down to such minor items as splicers."

The majority of equipment dealers say they particularly like to show their machines to projectionists, who know the advantages, or disadvantages, and the machine's practical application to putting on a good screen show.

They freely admit that they get good sales tips showing the equipment to projectionists, who can spot a good point or a poor one, so the salesmen can tailor his sales pitch to emphasizing the good features to the theatre owner. The old-time dealers say: "What's wrong with that?" We both gain chatting about the business in which we both make a living. The machine operator knows what's going on in the theatre equipment field; and we know what the expert who has to manhandle the machine, thinks about the equipment and we can point out its good features to the exhibitor who is a prospect for buying the equipment."

Several supply dealers say this is a manifestation of lack of interest in the business of theatre equipment, not alone by the projectionist but by the whole film industry. Most of them say that the "glamor" has been taken off films by television.

But long before television got into so many homes as now have receiving sets, things were happening to the exhibition branch of the industry. It used to be that the projectionist was part of the theatre's family, and he would be present at all meetings, which rarely occurs these days. This has resulted in a sort of "house divided" in the average theatre's family. For one thing, sizeable income to the exhibitor comes from the concession business, and the mounting paper work by the manager, projectionist, and even the assistant manager, are among the factors that account for the "busy work" that divert house personnel from showbusiness activities.

Whatever the cause, theatre equipment business does not make supply dealers nor the manufacturers very happy. The latter have been cutting down on projection equipment, and some former stalwarts of the equipment makers have diversified to the point where they are doing little in their factories as far as theatre equipment is concerned.

But as long as people are gregarious and want society with other humans, the film theatre will exist, and some film industry leaders — producers as well as exhibitors, look for the business to improve this year, and are betting coin on it by investments in film attractions and new theatres and refurbishing older ones. So maybe the veterans will see some of the proven practices of the past revived and be called "new" as the film industry gets back to showbusiness.

INTERNATIONAL PROJECTIONIST

Volume 37 March, 1962 Number 3

EQUIPMENT FOR 70-mm PROJECTION

By ROBERT A. MITCHELL

PROJECTION PRINTS wider than the standard 35 millimeters have always had ardent proponents. The Corbett-Fitzsimmons fight at Carson City, Nevada, in 1897 was recorded on film 2 inches wide. And when sound-on-film processes were being developed, film widths of 46 mm, 55 mm, and 61.3 mm were seriously proposed.

The 56-mm and 65-mm widefilms pioneered by Paramount in 1929 made no headway at all; and the 70-mm Fox Grandeur system of the same year made little impression upon moviegoers. Even though both systems were furnished with fairly good projection equipment — Ernemann for the Paramount process and Simplex for the Fox Grandeur method, the original 35-mm Edison film standard won the battle.

Accordingly, wide-gauge films were tucked away and forgotten during the long interval from 1931 to 1954, in which year the brand-new Todd-AO 70-mm process engineered by American Optical and N. V. Philips' Gloeilampenfabrieken made its appearance.

Todd-AO Best for Widescreen

There is a vast difference between the Todd-AO process and earlier widefilm attempts. Unlike the Fox Grandeur process which had only black-and-white photography, single-channel optical sound, and low-efficiency arc lamps at its disposal, Todd-AO has full color, 6-track magnetic stereosound, and modern high-intensity reflector of high optical speed. Moreover, there is no comparison between early widefilm projectors and the modern dual-purpose 70/35-mm equipment available today.

The wide panoramic screen, now a commonplace, was a novelty about ten years ago. Small sections of the public had thrilled to Cinerama; and larger numbers of moviegoers had just experienced the realism of 3-D stereoscopy and the panorama of CinemaScope. The thing was in the air, so to speak; and the demand for thrilling new screen realism was soon to be satisfied by the definitely superior pictorial and sound quality of 70-mm film as fashioned by engineering brains of the highest caliber and by the inimitable showmanship of the late Mike Todd. Motion-picture entertainment had technically "come of age."

In addition to the natural color, realistic sound, and brilliant illumination of the panoramic screen (unfortunately curved), the Todd-AO 70-mm process initially had the advantage of a frame rate of 30 per second to give smoother motion and to eliminate flicker.

At the standard rate of 24 frames per second, there are 48 light pulses on the screen every second, a rate not quite high enough to eliminate the sensation of flicker in bright areas of the image. The 60-cycle pulse rate of Todd-AO projection is well above the threshold of perception at all practicable light levels.

The Sins of Hollywood

Although the marvelous color and sound of modern 70-mm prints are available to all theatre owners desirous of giving their patrons the very best in screen realism, the short-sighted niggardliness of Hollywood's strictly commercial mentality soon robbed 70-mm film of its superior, flicker-free frame rate.

By reverting to the old 24-frames/sec. rate, the need for two sets of cameras, one for Todd-AO prints and the other for 35-mm CinemaScope prints of the same picture, was eliminated. Studio financial wizards saved a buck, but sand was thrown into the machinery, figuratively speaking. Both sets of prints, 70-mm and 35-mm, are now prepared from the same large-frame camera negatives photographed at 24 frames per second.

This is not all. Criticism may also be leveled at those producers who degrade the product of a multimillion-dollar investment by making it available for exhibition where the only modern equipment is the popcorn popper. Is it right to penalize exhibitors who have invested in the tremendous

potentials of high-quality 70-mm presentation by simultaneously, or soon afterward, releasing 35-mm print-downs of 70-mm blockbuster productions? We think not. And even though this harmful practice may seem to be only an irksome trade matter, the abandonment of the highly desirable 30 frames-per-second rate for 70-mm prints stems directly from it.

The use of curved screens for single-strip projection, 70-mm or 35-mm, is still another industry ineptitude. To repeat once again what every projectionist must know: curved screens distort the projected pictures geometrically, they make focusing difficult by opposing the natural curvature of the field (which actually **bulges** toward the projectors), and they provide no illusion of "surround" or depth whatever. A curved screen does not subtend a greater visual angle than a flat screen of the same size, shape, and distance; and its curvature is far beyond the limits of binocular stereoscopic vision.

In spite of these indisputable physical facts, certain industry factotums still persist in urging the use of curved screens for single-strip projection. **No matter whether the film be 70 or 35 mm in width, the screen upon which it is projected should be absolutely flat.**

Advantages of Large Apertures

The standard 70-mm projector aperture measures 1.913 by 0.866 inches, an aspect ratio of 1:2.21 at a 0° projection angle. This aperture has an area 3.35 times that of the conventional 35-mm aperture (0.825″ × 0.600″), or fully 4.49 times that of a 35-mm aperture of 1:1.85 aspect ratio (0.825″ × 0.447″). This means that 70-mm film is capable of passing from about 3¼ to 4½ times more light than 35-mm film, and giving a screen image having somewhat greater definition and overall pictorial quality.

As far as image definition is concerned, we must guard against exaggeration. We know that definition is largely a function of **negative-frame** area for black-and-white film. That is, a 70-mm B & W contact print from a 65-mm negative and a 35-mm B & W reduction print **from the same 65-mm negative** both give screen images of comparable definition quality, even though the 70-mm print is capable of giving a much brighter image or of adequately filling a giant-size screen without the deterioration experienced in 35-mm projection.

In the case of color, however, the print itself fails to preserve all of the image definition of the negative. The print adds its own defects to those of the negative. The 70-mm color contact print will therefore give a screen image having 2 or 3 times better definition quality than the 35-mm reduction print made from the same negative. In addition, if the 35-mm reduction print be anamorphosed for CinamaScope, still more definition may be sacrificed by the "squeezing-unsqueezing" optical transformations, depending upon the quality and adjustment of the anamorphic lenses.

Forasmuch as color photography is normally the rule for widescreen productions, the superiority of 70-mm projection on several counts is self-evident.

Another popular 70-mm projector aperture measures 1.900″ × 0.808″ for an aspect ratio of 1:2.35, the same as that for 35-mm CinemaScope. Any aspect ratio between 1:2.00 and 1:2.35 is feasible in 70-mm projection, as the camera aperture for 65-mm negative measures approximately 2.07″ × 0.91″.

Peaceful Coexistence of Gauges

Will 70-mm widefilm someday supplant 35-mm for theatre-release prints? Probably not. It seems that 35-mm prints are here to stay, and that 35 mm and 70 mm will exist side by side for along time to come. That is why all 70-mm projectors for **dual-purpose** machines for **both** widths of film. Not all pictures are of the spectacular blockbuster



FIG. 1 — National-Seventy projectors on Bauer U2 pedestal bases in the projection room of the Pantheon Theatre, Toledo.

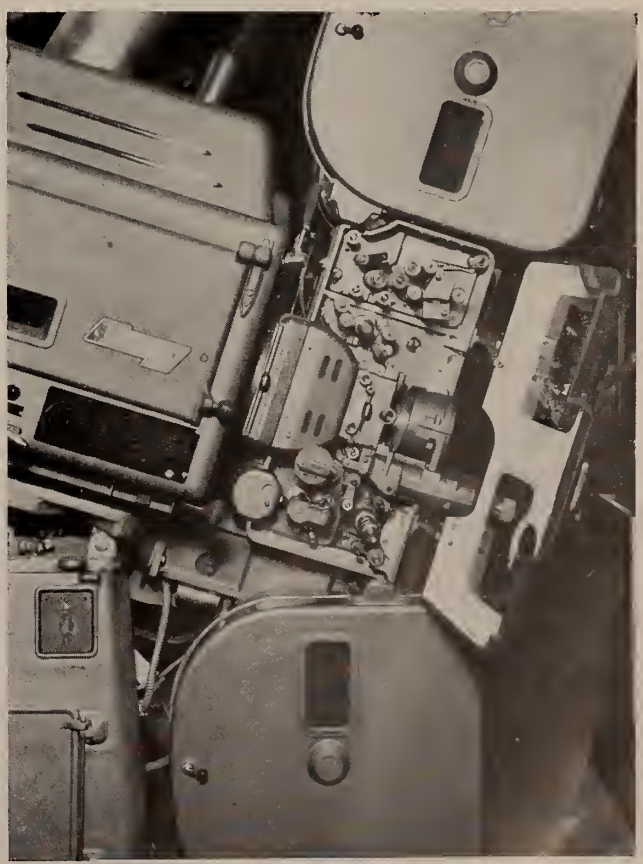


FIG. 2 — Closeup of a National-Seventy mounted on a Simplex LL-1 pedestal in the Fisher Theatre, Detroit. The door of the mechanism has been opened to reveal the roomy interior and clean design of the film path.

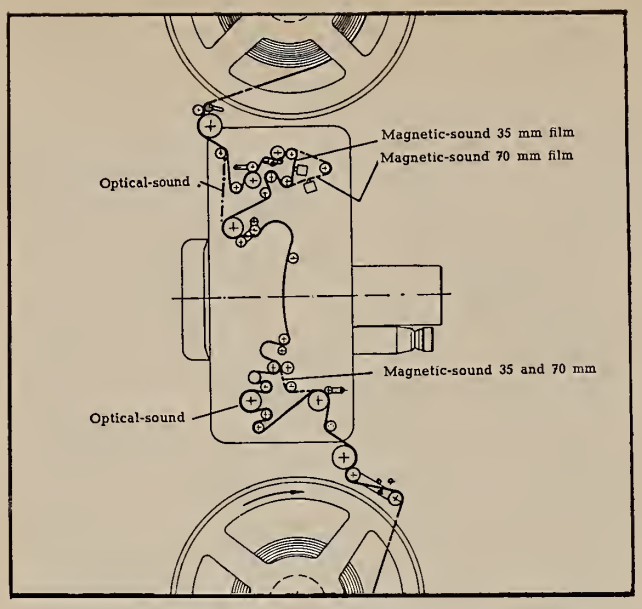


FIG. 3 — Film path of the National-Seventy 70/35-mm mechanism. Note the alternative routes to accommodate 6-track magnetic sound, 4-track magnetic (35-mm), and single-track optical (35-mm) sound. To date, all 70-mm prints have 6 magnetic tracks for full stereophonic reproduction.

type, nor should they be. The standard 35-mm gauge, even with black-and-white photography and monaural optical sound, is ideally suited to the more introspective type of photoplay in which the depicted characters are revealed in a manner too intimate for the wide screen.

This does not solve the problem of obtaining enough light on screens wider than 40 feet, however. Lab men may shudder, but this writer would recommend 70-mm blowup prints of black-and-white 35-mm productions for use in the larger theatres and in drive-ins!

The users of modern 70/35-mm projectors, therefore, can be assured of consistently obtaining on their screens the very best results from 35-mm as well as 70-mm prints. Projectionists know the truth; but exhibitors constantly have to be reminded that worn out, obsolescent projectors and sound systems are unable to do justice to any type of print.

All Theatres Need 70 mm

It is sometimes groundlessly maintained that most theatres cannot afford modern dual-purpose projection and sound equipment. Why not? Can these exhibitors afford **not** to present the best pictures in the best possible manner? More widespread use of the breathtaking realism of 70-mm projection and stereophonic sound is urgently needed to pull people away from their TV sets and once again make going to the movies a satisfyingly thrilling experience.

The drive-ins, too, can profit from 70-mm projection, even though stereophonic sound cannot be utilized in the usual open-air theatre. But the fact remains that the 35-mm aperture is simply **too small** for screens more than 40 feet wide. It is high time, we think, for distributors to make more 70-mm prints available to drive-ins as well as to other theatres, and for the owners of drive-in theatres to get down to business and install dual-purpose projectors.

Among the several excellent 70-mm projection and sound equipments available to theatre owners in the United States, three have been selected for discussion in the present article. These are the National-Seventy (Bauer U2), the Norelco (Philips Universal), and the Victoria-X (Cinemeccanica). Others will be described from time to time in future issues of IP; and specific points not covered in these general descriptions will be given on request whenever possible.

Now, each of the aforementioned 70/35-mm projectors has proved itself over several years of gruelling service in theatres of all sizes, each has received the enthusiastic approval of projectionists and engineers, and each has been especially designed for the exacting job of projecting wide-gauge film.

The demands made by 70-mm film on a projector are great. Not only is the film twice as wide as the conventional standard gauge, but the intermittent pulldown is 5 perforations instead of 4. Accordingly, the film speed is 125% times normal at a frame rate of 24 frames per second, or 156¼% times normal at the Todd-AO rate of 30 frames/sec.

The National, Norelco, and Victoria 70/35-mm projectors are characterized by unit construction of the entire picture and sound mechanism, simplified automatically lubricated gearing, and rugged, oversize construction of all gears and bearings. Each has a separate takeup motor for smooth, uniform winding of 4,000-foot reels of 70-mm film, cooled apertures, and other modern features required for the best and most dependable performance.

Despite the heavier loads of 70-mm film projected at increased speed, each of these machines is actually more gentle to the prints than the average 35-mm projector, and has a longer mechanical life. The manufacturer of one of these projectors reports that 70-mm prints can be run up to 1500 times in his machine! Compare this with the 300 to 500 runs from the average 35-mm print and with the horrible screen images we see in many theatres after a comparatively few runs, and it will be appreciated that 70-mm prints offer a real economy to distributors. Another manufacturer of 70-mm projectors reports that his replacement-parts business has amounted to only $140 for a 3-year period even though several hundred installations are in use. This represents an unprecedented economy for the theatre owner.

Modern Features of 70-mm Projectors

Rapid, easy conversion from 70-mm projection with 6-track magnetic sound to 35-mm projection with either 4-track magnetic or 1-track optical sound is another outstanding feature of the three projectors we are considering.

The change from one process to another takes less than

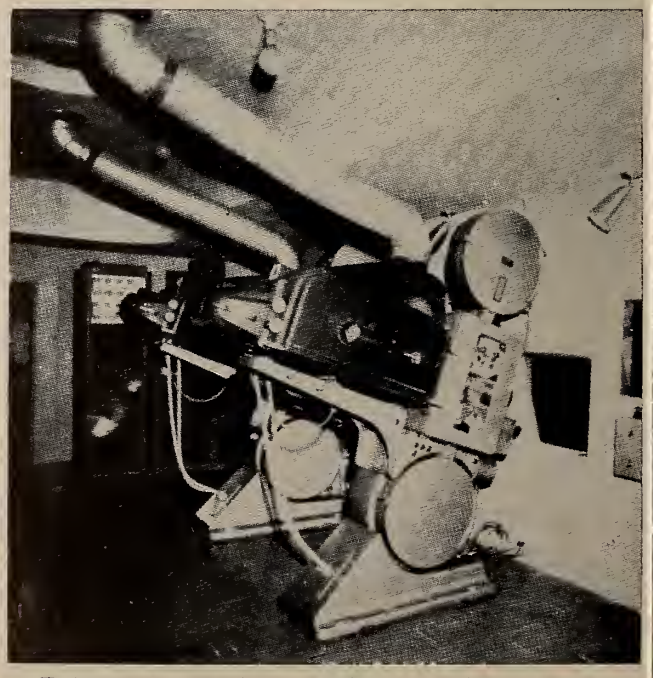


FIG. 4 — An installation of Philips Norelco projectors.

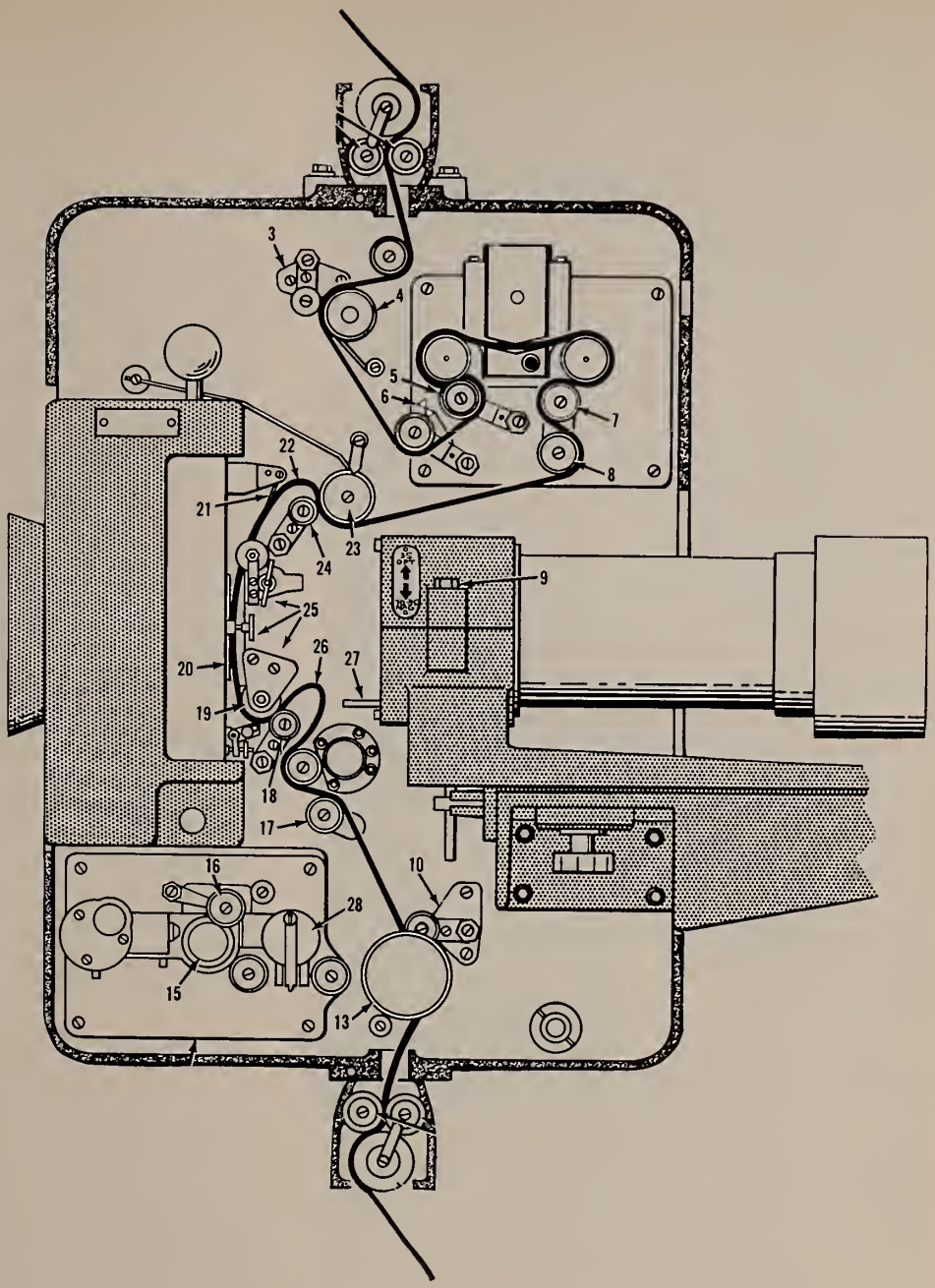


FIG. 5—Film path of the Norelco 70/35-mm mechanism for both 70-mm and 35-mm magnetic reproduction. Note that the optical reproducer is bypassed.

4 minutes! The larger sprockets and roomy construction make for easier threading and maintenance; and the drive gearing has been vastly simplified—quite a revelation to projectionists familiar with only the older 35-mm machines.

Each of these projectors employs a cone-type shutter having the cutoff plane positioned very close to the aperture for the highest transmission efficiency. This is extremely important for single-acting shutters. Double-acting shutters (cylindrical or double-rotor types) may be placed a few inches back of the aperture and still work with maximum transmission efficiency. However, the gearing of the cone-type shutter is simple and dependable, making this type of shutter the favorite with many projectionists.

All brands of 70/35-mm projector that we know of have an unobstructed light path to accommodate arc lamps and lenses of the highest available optical speeds (f/1.7—f/1.5). Curved film gates, separate take-up motors, automatic lubrication, compact plug-in photocell preamplifiers, and heavy, vibration-free pedestal bases are among other attractive features of these projectors. Each can be quickly changed from 24 to 30 frames/sec. operation.

National-Seventy (Bauer U2)

The National-Seventy or Bauer U2 70/35-mm projector was developed at the world-renowned factory of Eugen Bauer GMBH in Stuttgart, and is specially manufactured for Simplex (NTS-GPL) in accordance with design specifications set forth by the same engineers who have contributed so much to making the Simplex projector a leading favorite of American projectionists. In the National-Seventy, therefore, we have a high-quality machine produced by the combined engineering experience and know-how of two of the world's oldest and most respected manufacturers of motion-picture equipment.

Single-frame construction is a "must" for any modern projector. The old-fashioned combination of separate soundheads and picture mechanisms became ridiculous the moment that "talking pictures" became the established medium—and that was more than 30 years ago! The National-Seventy therefore utilizes a single enclosure for all picture, magnetic-sound, and optical-sound components.

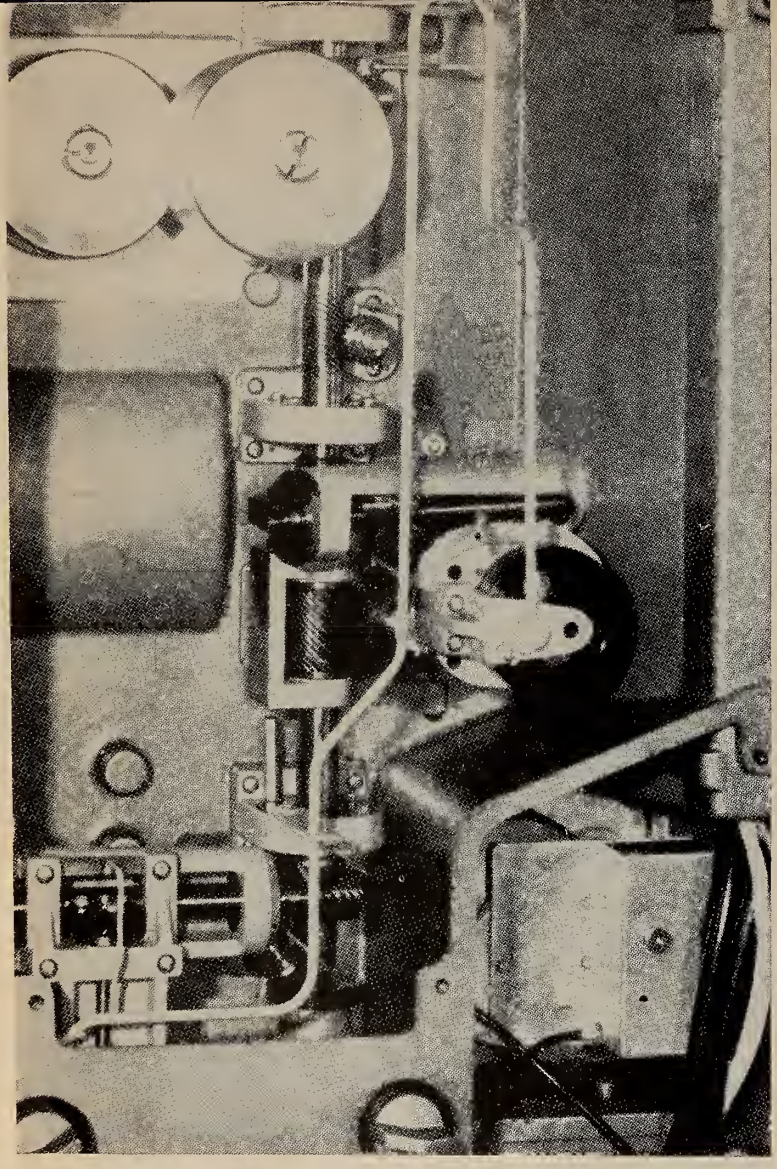


FIG. 6 — Gear side of the Norelco, showing the simple, sturdy construction which makes for dependable, trouble-free operation. The entire mechanism is continually bathed in filtered oil.

There is only one door for the projectionist to open and close.

This projector is available in two versions. One is of the automatic type using the Bauer pedestal having the requisite microswitches and relays (Fig. 1). The other is adapted for mounting on existing Simplex LL-1 heavy-duty pedestals which, of course, results in a saving to the exhibitor (Fig. 2). This version uses the standard SH-1009 Simplex soundhead motor in conjunction with Gilmer pulleys and belts.

An especially attractive feature of the National-Seventy is the quick-change lens mount. The lenses for every process, 70-mm and 35-mm, are mounted in prefocused holders which can be removed from the projector and replaced in a jiffy by unscrewing a single knurled screw.

As with any dual-purpose projector, the film gate, aperture, and trap must be exchanged when converting from 70-mm to 35-mm projection, and vice versa. This change is faciliated in the National-Seventy by mounting gate and trap on steel guide pins from which they can be slid off in a single movement.

National-Seventy Curved Gate

The National-Seventy gate is curved concave to the lens for both gauges of film, the radius of curvature being about 12 inches for optimum optical performance. The resulting curvature of the film stiffens it across its width and greatly reduces the fluttery buckle which is aggravated by high light intensities. Curved gates also practically eliminate side-weave.

The curved film-supporting rails of the trap are formed of highly polished fine-grain cast iron proved to have excellent sliding and wearing qualities. The flexible pressure straps in the aperture-holding film gate are of Teflon with steel backing, and are adjustable for proper tension. Teflon provides a wear-resistant, self-lubricating, "non-sticking" sliding surface.

In addition to the film trap and lens, the sprockets must be changed when converting the National-Seventy from one gauge to the other. All sprockets are quickly removed by loosening one screw. The entire conversion operation is said to require about three minutes. Pad rollers do not need to be changed, but are merely swung to new centers on eccentric loading studs.

The gate of the National-Seventy is air-cooled, a forced draft being applied to both sides of the film at the aperture through built-in orifices. There is also a low-pressure ventilating system which serves to keep the shutter housing and light baffles cool.

Although the National-Seventy can be used with any modern sound system designed for 6- and 4-channel magnetic and single-channel optical reproduction, the new Simplex X-L "preselect" sound system is especially suitable for this equipment. One of its desirable operational features is a system of preset switches which make possible instantaneous switching of the sound from one process or channel to another—including the non-sync input—automatically the next time a changeover is made.

Norelco (Philips)

To Philips, one of the oldest, largest, and most respected manufacturers of various types of motion-picture equipment, belongs the signal honor of producing the very first complete dual-purpose 70/35-mm projector according to the exacting specifications of the Todd-AO process. The sturdy, high-precision design of Philips projection and sound equipment embodies numerous technical features which represent unique advances in the art. The Norelco projector is accordingly held in the very highest esteem by engineers and projectionists; and exhibitors who insist upon the very best projection-room equipment respect their judgment.

The Norelco is truly a dream-come-true from the point of view of the projectionist. Not only does it utilize the same high quality of design, construction, and finish for which a long line of Philips theatre projectors is famous, but its major parts are manufactured and assembled by American craftsmen in the modern North American Philips plant at Mount Vernon, New York. The Norelco is used in hundreds of key American theatres and in the studios and laboratories of 20th Century-Fox, M-G-M, DeLuxe, Technicolor, and Eastman Kodak.

Massive, roomy, single-frame construction makes the Norelco unusually easy to operate, clean, and maintain in tip-top condition. It is built to accommodate the largest, most powerful arc lamps. Prefocus mounts make possible rapid, accurate exchange of lenses with automatic compensation for the center-line of 70-mm and 35-mm films.

The cone-type shutter of the Norelco is unique, and probably the most efficient shutter in use. Instead of having two

blades and revolving once for each frame of film, the Norelco shutter has only one blade and revolves two times for each frame. This results in a more rapid cutoff, and thus increases the transmission efficiency of the projector for the brightest possible illumination of giant screens.

Simplified Threading of Norelco

Threading up the Norelco is very easy, thanks to the small number of rollers and their logical, well-spaced arrangement, shown in Fig. 5. Mistakes that could result in film damage are practically impossible. All of the idler rollers are suitable for both 70-mm and 35-mm film, but the sprocket pad rollers must be changed when converting from one film-width to the other. Best of all, the same threading path through the magnetic soundhead is used for both 6-track 70-mm prints and 4-track 35-mm prints.

Because all of the sprockets are of the double-purpose type carrying two sets of flanges, none of the sprockets has to be changed during conversion. Less than four minutes completes the job.

Operation of the Norelco is also simple, inasmuch as conveniently placed push-buttons control all essential functions. Tension of the steel pressure-bands of the film gate is centrally adjusted by a single knob. Combined water- and air-cooling of the aperture plate and heat baffles insure a low temperature of the film even when the highest arc currents are employed.

The optical soundhead exemplifies a design which is exclusive with Philips, so far as this writer knows. The soundtrack is projected upon the scanning slit with a magnification of 13.5 X; and the magnified soundtrack is visible through an inspection window, which makes focusing and lateral adjustment very easy. According to photometric tests with which the writer is personally familiar, the optics of Philips soundheads provide unusually uniform illumination along the length of the slit, and thus across the soundtrack. This is essential for undistorted reproduction of variable-area tracks.

Victoria-X (Cinemeccanica)

Superb performance characteristics and exceptionally quiet and trouble-free operation have made the Victoria dual-purpose projector a favorite with projectionists all over the world. Indeed, the Victoria-X 70/35-mm projector and sound equipments have gained an enviably favorable reputation even on Broadway where they operate in competition with all other makes.

Everyone seems to like the Victoria. As a matter of fact, this writer has received many favorable unsolicited reports on the Victoria-X from projection engineers and installation service men who know good equipment, thus confirming the quality and cinematic know-how for which Cinemeccanica of Milan has been famous for more than forty years.

Victoria-8 for Special Needs

While this writer personally prefers unit construction of the picture and sound-reproducing mechanisms, as exemplified by the Victoria-X as well as the Bauer National-Seventy and Philips Norelco, there seems to be some demand among the smaller American theatres for separate picture mechanisms and sound reproducers. To meet this demand, a brand-new model called the Victoria-8 has been designed in accordance with the older American standards. The Victoria-8 thus enables exhibitors to get the advantages of superior Victoria 70-mm projection with magnetic and optical sound reproducers made by any of several manufacturers.

To make the transition to 70-mm projection easier for the smaller theatre, the Victoria-8 is also available as a straight

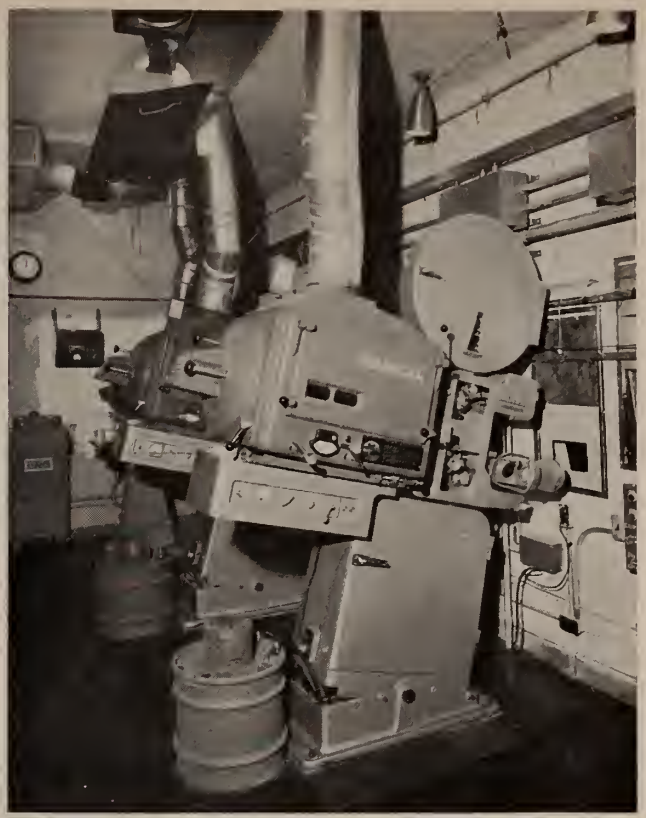


FIG. 7 — An installation of Victoria-X 70/35-mm projectors fitted with high-efficiency, easy-to-operate Strong 35/70 arc-lamps.



FIG. 8 — Rear side of Victoria-X pedestal opened to show wiring terminal boards, ventilating and film-takeup motors, and DC exciter supply and emergency AC supply. Observe the heavy-duty 3-phase motor which drives the projector mechanism at an exactly correct constant speed for both 24 and 30 frames/second projection.

35-mm projector which allows future inexpensive expansion to 70 mm.

As is the case with the other two superlative brands of dual-purpose equipment discussed in this article, the lens mount of the Victoria is profocused and quickly interchangeable. The sprockets are double-purpose and of large diameter for a better film wrap and lower shaft speed with longer bearing life. The dual-purpose pad rollers of the Victoria require only a simple shift from the "yellow" (35-mm) to the "red" (70-mm) position, and vice versa, without removal. So also with the magnetic cluster head. Indeed, only the lens and film gate with aperture need be changed to convert from one gauge to the other, a procedure which requires less than two minutes.

Backlash-Free Shutter

The Victoria employes a cone-type shutter which is spring-loaded to eliminate backlash and ghosts. The curved film gate has substantial curved pressure pads instead of flexible bands. Jump and weave are well below the Academy standards for permissible image unsteadiness, thus insuring top-quality screen images.

The film gate of the Victoria-X is cooled by both water and air. Both are needed for maximum protection of the film and the mechanism when powerful arc lamps are used. It is well known that direct irradiation of the film by the arc causes buckling and damage to the emulsion. The use of dichroic heat filters or "cold" lamp mirrors eliminates the danger of emulsion blistering; but forced-draft cooling of the film in the aperture is still necessary to reduce focus-ruining buckling of the film.

It is also well known that the total heat absorbed by film is transmitted by conduction from the heated gate runners which contact the perforation margins of the film. This heat shrinks the film, causing image unsteadiness, and gradually makes it brittle and liable to break on slight provocation. Conductive heating of the film requires water-cooling of the gate and aperture-supporting block. A water-cooled gate, such as that in the Victoria-X, remains cool during projection, and thus keeps the film cool.

As in the National-Seventy and Norelco, lubrication of the Victoria is automatic; and a separate motor is employed for the lower-reel takeup to insure uniform winding of the film under the proper degree of tension.

The sound reproducers of the Victoria-X are extremely good, and insure flutter-free reproduction of both magnetic and optical sound. As stated previously, the magnetic cluster need only be flipped over when changing from one width of film to the other — there is no difference in threading for 6- or 4-track magnetic sound. Both tube-type and beautifully simple transistorized optical and multichannel magnetic amplifier systems are available for Victoria projection equipment.

With such truly superb projectors as these and other brands to make available to every theatre the patron-attracting realism of 70-mm projection and sound (not to speak of better 35-mm presentation!), exhibitors have no valid excuse for retaining the obsolete booth equipment which is a detriment to the entire industry. And when film distributors finally realize that giant drive-in screens require a wide-gauge film for adequate picture brightness and definition, we may reasonably expect open-air exhibition to profit from a greater availability of 70-mm prints. **iP**

Projectionist Profile

Ben Olevsky Happy Projectionist As Chief of Radio City Music Hall

"Happy is the boy who discovers the bent of his life-work during childhood." That is the first sentence in the autobiography of a famous explorer.

And that would apply to the boy, now a middle-aged man—Ben Olevsky, chief projectionist at one of the world's foremost showplaces, Radio City Music Hall in New York.



Olevsky

At age twelve Ben fell in love with working in a theatre and knew right then "the bent of his life-work." That was when a spotlight man in the old Lyric Theatre in Brooklyn (Ben's native city) slipped him a quarter for working the spotlight while he went down to the corner saloon to have a few beers.

So the explorer's observation must be true, at least in the case of Ben Olevsky, who radiates happiness with life, particularly on his job at the Music Hall.

Of course, projectionists dream about a job in a theatre where the projection equipment, dual in all cases, is kept up to snuff, where the screen is replaced twice a year, and where projectionists get several prints of a new show and choose the best of the lot.

But there's a catch to such a job. A man to make good as a projectionist at the Music Hall must be "on the money," as the expression goes. This means strict attention at all his working hours; great teamwork with the stage hands, the spotlight men, the musicians, the stage show and ultra-precise timing per the schedule.

Olevsky has been chief of the booth at the Music Hall for six years, and he joined the theatre as a projectionist in 1943. During his boyhood days he wanted to be a stagehand, but once he looked at a projector he knew it was for him. That was in 1927, and he has been projectionist since. During his 43 years as a projectionist, he started as a part time operator in Brooklyn, Queens, Manhattan and Bronx theatres. Then he did a tour with the Randforce Circuit, in Brooklyn, for 13 years.

Asked what was the hallmark of an efficient projectionist, Olevsky had this observation: "He uses care. A careful man is better than a careless, brilliant technician who knows the machines he works with backwards and forwards. The efficient projectionist never turns his back to the screen while the show is running; observes the print while on screen for faulty patches, the proper functioning of his arc light and projector, and keeps his ears open to the monitor." **iP**

Nafash Installing World's Fair Projection Equipment

NEW YORK — W. G. (Bill) Nafash, assistant to Ben Olevesky, chief projectionist at Radio City Music Hall, takes a leave of absence to install projection and sound equipment at the World's Fair in Seattle.

Nafash left New York on March 18 and returns April 29. He will supervise the installation which was assembled by Reeves Sound Corp. **iP**

CELEBRATES ANNIVERSARY

NEW YORK — Joe Kleinman, vice president of the 25-30 Club and a member of the Radio City Music Hall projectionist crew, on April 16 starts a month-long vacation with his wife in celebration of their 40th wedding anniversary. They will make trip to the West Coast. **iP**

Equipment Dealers Stress Need for Cooperation by All

CHICAGO — Calling for strong cooperation between all industry elements — producers, distributors, exhibitors, theatre equipment manufacturers and dealers, Al Boudouris, president of Eprad, Inc., in addressing the meeting of the Theatre Equipment Dealers Assn., envisioned an increase of 5,000 hardtop theatres and 2,000 drive-ins in the next five years, with a wide wave of modernization.

The theatre equipment manufacturer and dealer, and theatre operator, emphasized that to get the fullest cooperation from all elements, "there must be established a central agency for the exchange and use of vital information." He stressed that "exhibitors need a central place to turn in all of their information, receipts, successes, failures. A central information, auditing and analysis group. This, an industrywide library and statistical organization to study motivation, to analyze the results of motion pictures by type, to analyze advertising, titles of pictures, picture content. This information to be available to everyone, including the advertising media and anyone else who has an interest in our business."

He also stressed as being imperative the "need to have more pictures in color. More pictures with magnetic stereo sound, more 70mm prints. Theatre owners who installed magnetic stereo sound equipment find that the film companies won't even produce pictures in stereo. Those who installed 70mm equipment can't get 70mm prints.

"We need to use the technological advances we now have. Color stereo magnetic sound, 70mm. Especially, since the public is so tremendously interested in hi-fi, stereo sound in their own homes."



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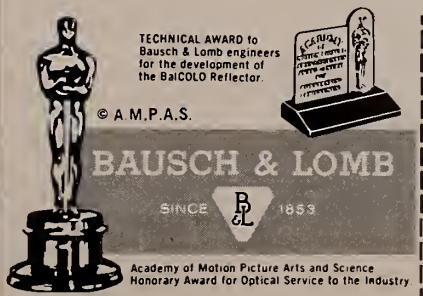
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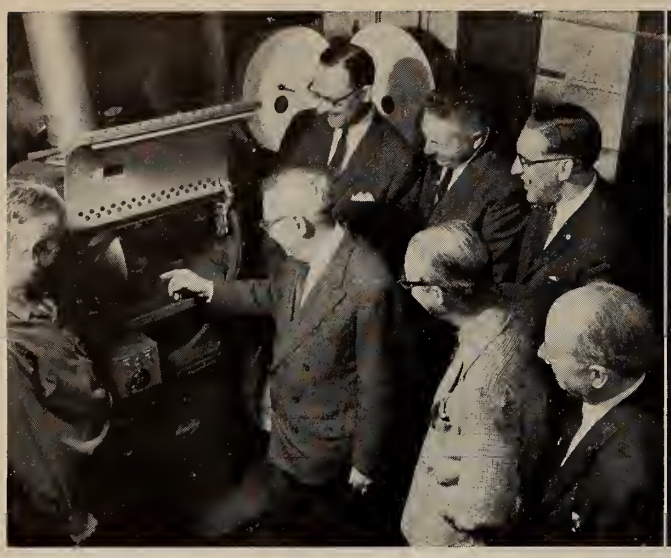
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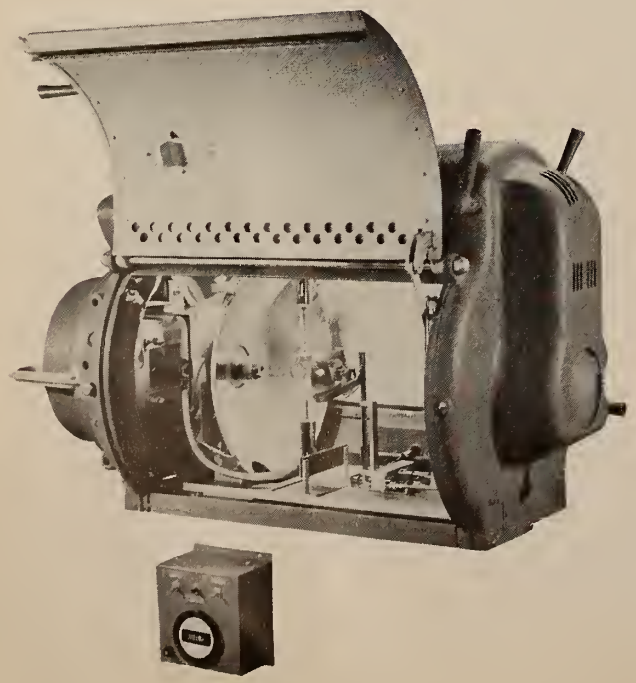
STRONG DEMONSTRATION — Projectionists from Toledo who attended the demonstration of the new Strong X-16 projection lamp included, left to right, front row, Bob Steinline, Maumee; Harold Plumadore, Paramount; Bob Feehrmeyer (front), Paramount; and G. M. Studebaker, service manager, National Theatre Supply, Detroit. Back row, Arthur J. Hatch, president of the Strong Electric Corp.; Arthur Partis, Loop; and Dick Bader, Loew's Valentine. Plumadore, Feehrmeyer, Partis and Bader are members of IATSE Local No. 228. At the right, theatre supply dealers who attended the Strong X-16 demonstration included, left to right, Milt Gibson and Gordon Gibson, Atlas Theatre Supply, Pittsburgh; Cliff Callendar, sales manager of the projection lamp division of the Strong Electric Corp.; C. M. Studebaker and Clarence Williamson, National Theatre Supply, Detroit.

Strong Electric Develops New Xenon Light Source; Projectionists in Toledo Area Get Full Demonstration

TOLEDO — The refinement of a new light source for motion picture projection was demonstrated by the Strong Electric Corp. here recently at the Maumee Theatre, Maumee, Ohio.

Utilizing tungsten electrodes in a Xenon atmosphere, totally enclosed in a quartz bulb, the light source has been under test at the theatre for an extended period of time.

Known as the Strong X-16, the projection lamps were demonstrated before a group which included theatre owners and managers, theatre equipment dealers from Detroit, Cincinnati, Cleveland, Chicago, Indianapolis and Toledo, projectionists, city officials, professors from the University of Toledo and newspapermen. Engineers from the Strong Electric Corp. explained the operation and technical aspects of the Xenon arc.



The opened lamphouse showing the Strong X-16 projection light source, tested for several months under actual operating conditions at the Maumee Theatre, Maumee, Ohio. A flickerless, pure white light and even light distribution are claimed for the new unit.

Advantages of the new light source include a steady, flickerless, pure white light with no discoloration at the screen. The spectral composition of the light makes it possible to show color films brilliantly and with excellent color reproduction. The color of the light is independent of voltage variations of the power line supply. A minimum of heat is projected to the aperture plate and film by this light source. Another projection advantage of this light source is the extremely even distribution of light throughout the total screen area.

Xenon arc bulbs make for greater simplification of operation for the projectionist, easier maintenance and cleaner equipment, whih should assure maximum life for the projector. The once-adjusted focus of the bulb stays constant. No moving parts are employed in the light source and no special cooling is required.

The 1600-watt Xenon bulb has a life expectancy of 1500 hours average and the cost of bulb replacements, together with that of electric current, is a little more per hour than the cost of current and carbons for operating the high intensity carbon arc 46 ampere projection lamp.

The Xenon arc source for projection is limited to a brightness which makes

it equivalent approximately to a 46 ampere carbon arc.

Xenon projection lamps can be effectively employed for projection on screens up to 28 feet wide, according to Arthur J. Hatch, president of the Strong Electric Corp. Screens of about this size are common with theatres seating up to 800 patrons.

The Strong Electric Corp., world's largest manufacturer of motion picture projection lamps for 36 years, also developed and manufactures arc camera and printing lamps for the graphic arts field, heat exchangers, rectifiers, reflectors, slide projectors, solar furnaces, spotlights, and transformers. Arc searchlights for airplane and field use are also produced for the military. For the past year Strong has also engaged in the production of solar radiation simulator systems for the development and testing of outer space vehicles and components. **iP**

LITTON SALES BOOM

LOS ANGELES—Litton Industries' sales for the first six months of the 1961-62 fiscal year totaled $168,000,000, Charles B. Thornton, chairman of the board of Litton, announced in a preliminary report. Sales reported for the same period last year were $108,202,000. After-tax earnings for the period totaled $7,440,000 as compared to $4,448,000 at the close of the comparable period last year. **iP**

Bookshelf

The S.O.S. Bookshelf of Technical Books, a pamphlet listing volumes dealing with motion picture production; sound recording and reproduction, TV techniques of production, electronics theory and practice, projection methods in theatres and screening rooms, and other books for instruction or references purposes, together with price of each, has been issued by S.O.S. Photo-Cine-Optics, Inc. (formerly S.O.S. Cinema Supply Corp.) of 602 West 52nd St., New York 19, N. Y. **iP**

B & L CATALOG INDEX

ROCHESTER, N. Y.—A new 22-page illustrated index, published by Bausch & Lomb, makes it easy to select proper informational data on the company's line of optical and electronic products. Including all motion picture projection equipment, catalogs of allied products are grouped together for quick, easy reference. Entries include cover illustration, brief description of contents, and catalog number. A copy is available by writing to Dept. F-46, Bausch & Lomb, Inc., Rochester 2, N. Y., specifying Catalog L-86. **iP**

Why Dim Screen Light with Good Arc Lamps? Check Your Carbon Trim and Current!

Spot and Flood Lamps

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ARC AMPS	ARC VOLTS	CATALOG NUMBER	CORED POSITIVE	CATALOG NUMBER	"OROTIP" CORED NEGATIVE
40-50	54-56	L 1321	5/8" x 12"	L 1103	5/16" x 6"
50-55	56-57	L 1327	3/4" x 12"	L 1103	5/16" x 6"
55-65	57-59	L 1327	3/4" x 12"	L 1112	11/32" x 6"
65-70	59-60	L 1330	7/8" x 12"	L 1112	11/32" x 6"
70-85	60-63	L 1330	7/8" x 12"	L 1121	3/8" x 6"
85-100	63-66	L 1333	1" x 12"	L 1127	7/16" x 6"

Spot and Flood Lamps

A.C. LOW INTENSITY • INCLINED VERTICAL

ARC AMPS	ARC VOLTS	CATALOG NUMBER	UPPER CARBON	LOWER CARBON
25-40	25-28	L 1500	1/2" x 12"	1/2" x 6"
40-60	28-32	L 1503	5/8" x 12"	5/8" x 6"
60-75	32-35	L 1506	3/4" x 12"	3/4" x 6"
75-100	35-40	L 1509	7/8" x 12"	7/8" x 6"

Spot and Flood Lamps

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ARC AMPS	ARC VOLTS	CATALOG NUMBER	CORED POSITIVE	CATALOG NUMBER	"OROTIP" CORED NEGATIVE
85-95	58-62	L 0109	11 mm x 20"	L 1115	11/32" x 9"
125-135	68-72	L 0115	13.6 mm x 22"	L 1130	7/16" x 9"
140-160	72-78	L 0115	13.6 mm x 22"	L 1139	1/2" x 9"

Motion Picture Projection Lamps

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ARC AMPS	ARC VOLTS	CATALOG NUMBER	CORED POSITIVE	CATALOG NUMBER	CORED NEGATIVE
16-20	54-57	L 0921	10 mm x 8"	L 0906	7 mm x 8"
21-32	54-57	L 0924	12 mm x 8"	L 0912	8 mm x 8"
32-42	54-57	L 0927	13 mm x 8"	L 0918	9 mm x 8"

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"PACIFIC PANORAMA"

by Hank Boldizsar

The local lads are putting the pressure on me again: Do something about the condition of motion picture film delivered to the projection rooms, and protest the ridiculous array of cue marks that some "other" projectionists are "butching" the film, they say. These items can inflame the hearts of a great many of you conscientious neighborhood house projectionists, so before you take your muskets down from the wall, let's have a "fireside" chat.

A few years ago I picked up the crusade for better film inspection and carried it to the International office as well as to many locals in our area and to the California District No. 2 Council. Let me assure you that everyone concerned did their part to correct the situation. Perhaps you will recall reading about it as part of the business of the IATSE convention three years ago. Your I.A. bulletin, I.P., and the convention publication gave the matter sufficient space to get the point across.

Just how much good was accomplished by all this I cannot say. But one thing must be understood, the "human element" (that's where you and I fit in) is largely to blame. Reduced personnel at the exchanges cannot properly handle the work load. When we receive a print in our projection room, we repair it just enough to get it through our schedule. Projectionists at the bottom of the totem-pole have nothing but trouble with these worn out ill-repaired prints, and actually they are the ones with legitimate gripes.

I would rather not go another round in this battle because I honestly believe that we should clean our own doorsteps first. If we gave just a bit more of our time to repairing a print for the "next man" as well as for ourselves, films in current circulation would be greatly improved. Actually, isn't this a part of our job in the booth? We do have a problem with film, but we are better able and certainly better qualified to correct the problem than are the personnel employed by film exchanges. Give it some thought and a little action — I'll bet you'll agree.

As for the cue-marks — especially those made by street car conductors — what can you do??? The question puts us right back on our own doorsteps, doesn't it? A good place to start something about the situation, or to get the point across, is your local's meeting hall. Let's try it for size.

* * *

"God grants liberty only to those who love it, and are always ready to guard and defend it." — Daniel Webster.

I evaded one crusade — but don't sigh in relief just yet. I have another one in mind and in this crusade I need your help and need it badly. The subject matter is not new — as a matter of fact it is as old as time itself. Unfortunately it seems to have invaded the theaterical world and infested our film capitol so much that Los Angeles is frequently referred to as "The Smut Capitol of the World."

Have you glanced at the film section of your local newspaper lately and noticed the array of trash that is pushed off as "adult entertainment." My attention is repeatedly called to the deplorable fact that this skid-row type of film entertainment has in recent months spilled over to the neighborhood theatres where your youngsters (and mine) can get a good glimpse of just what this erroneously rated "adult entertainment" really is. The stills out front are really something to write home about and the advertisements make an intelligent adult wonder how long the police and citizenry will tolerate this despicable subversion of our youth — and simple minded adults.

To this writer the "Adults Only" fare offered by the "art houses" is about as far left as the Manifesto itself. No alert American would deny that the end result of the two is the same. We agree with our mentors that something must be done about this situation, and we are open for suggestions from our readers as to the most effective course of action to follow. Determined action on the part of projectionist union locals, we believe, would command the full support of P.T.A. and church groups and the police department of your own city.

Brother projectionists, shall we join forces in this crusade for decency and patriotic Americanism on our motion picture screens? A community service such as we here propose can do much to swing public opinion in favor of organized labor.

* * *

"America's best defense lies in the alertness of its patriotic citizens. If we open our eyes, inform ourselves, and work together, we can keep our country free." — J. Edgar Hoover.

Something new will be added soon! Fred Stein Enterprises announce construction soon of their new theatre (near the Eastland). Described as a "luxurious modern motion picture theatre, 1100 seat capacity and equipped with every new inovation" this house will surely be the "place to go" for friends of Local 150. **iP**

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Striper Available

NEW YORK — S.O.S. Photo-Cine-Optics, Inc., is now making the Dunning Animatic Striper available. This compact table top machine is said to take no more room than a typewriter. It applies laminated pressure sensitive adhesive recording tape to film without glue, is manually operated and includes 400 feet rewind and take-up arms. A 30 mil magnetic stripe can be applied to an 8mm original or print or a 50 mil stripe on half the width of a 16mm optical track.

Stripping can be done between the perforations and the edge of a 16mm original or print as well. A 16mm sound print with a 100 mil stripe can have a 30 mil balance stripe put on the opposite side. The Dunning will intermittently place a stripe on any desired section of film.

The entire Dunning unit weighs 5 pounds, and is priced at $198. 100 feet of striping tape is $1.50 for 30 mil; $1.60 for 50 mil and $1.75 for 100 mil. Descriptive literature is available on request from S.O.S. at 602 W. 52nd St., New York 19, N. Y. **iP**

TAPE REEL—New Packaged Tape Reel called Sealedreel, seals tape and film from dust and extremes in humidity. A molded resilient band of patented design snaps and locks into a conforming bead around the periphery of the reel. The molded band also wedges itself into the reel and provides a substantial support to the reel flanges, against bending and consequent damage to tape or film. The reel is manufactured by PRO-TEX REEL BAND CO., Cleveland, Ohio.

Southern States Set Up SMPTE Chapter

HUNTSVILLE, ALA. — Projectionists in Alabama, Mississippi and neighboring states interested in the technical aspects of their crafts are expected to be candidates for membership in a new chapter of the Society of Motion Picture and Television Engineers, with headquarters here.

Because of the "rapid growth" of professional engineering interest in SMPTE in the area, the board of directors has approved the group. **iP**

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Rebuilts' Effect On Industry Coming to End

NEW YORK — Rebuilt projectors, sound systems and other equipment ceased to be a glut on the market, thereby opening up a greatly enlarged potential for new business, according to Larry Davee, president of the Theatre Equipment and Supply Manufacturers Assn.

"Thirty-year-old equipment and even older, just cannot be rebuilt well enough to do a good job in theatres," Davee said. "The newer, better designed equipment available to theatre owners these days are miracles of perfection, and theatre patrons know the difference.

"Theatre owners have come to realize that movie-goers recognize inferior projection and sound, and have just about reached the point to discard outworn equipment and make deals for new.

"That is why we think that our forthcoming TESMA Trade Show next December in Cleveland, in cooperation with National Allied and with the Theatre Equipment Dealers Assn., is going to be a very big success.

"TESMA withdrew from participation in equipment trade shows four years ago, since our analysis of the market at that time did not indicate to us that the potential for new business was there. Current research tells us that the business climate for new sales is good now and will get even better. For this reason and others we want to show new equipment to our customers this year. The Allied-TESMA-TEDA three-day show, starting Dec. 3 in Cleveland's Sheraton Hotel, is the best possible opportunity to present new and improved models to theatre owners and to theatre equipment dealers," stated Davee.

TESMA's Davee further stated: "Our own directors, at a recent meeting in Chicago, voted unanimously to join with Allied in Cleveland to stage a Trade Show. Everyone of the 25 or so manufacturers who were present at the meeting stated openly that they would contract for booth space at the show. We feel that these pledges are a tremendous start toward having a capacity show and indicated that when our detailed brochure goes out that we will be sold out in a very short time."

E. H. Geissler, the president of TEDA, stated that he and his organization welcomed the news.

Marshall Fine of Cleveland, president of National Allied, said: "This is the first time in four years that Allied has felt the theatre business climate was right enough to ask TESMA to join with us in staging a motion picture equipment trade show.

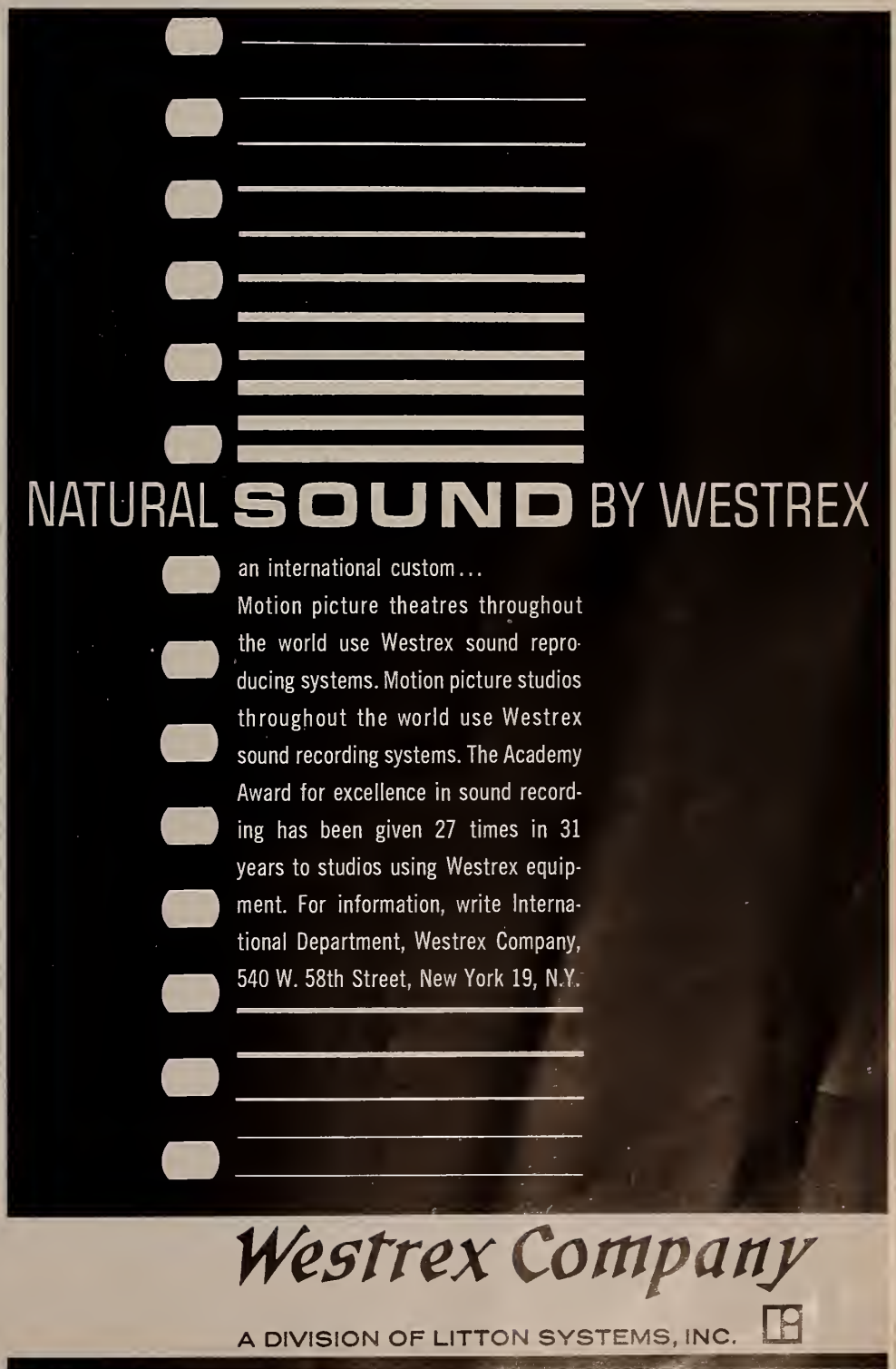
"Allied's market research has indicated that theatre business and theatre equipment business show enormous new potential. The manufacturers of theatre equipment have agreed with us and are ready to show new equipment and new designs to all theatre owners."

iP

Keuffel & Esser Enter Audiovisual Market

HOBOKEN, N. J. — The formation of an audiovisual division of Keuffel & Esser Co. has been announced. Initial emphasis will be placed on products required for overhead projection and including transparency production equipment and materials. Headed by Eric F. Burtis, the new division will market its products through a national network of audiovisual distribution outlets.

iP



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*Actually, a donkey in this case.

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Or—for the purchase of film: **W. J. German, Inc.** Agents for the sale and distribution of Eastman Professional Films for motion pictures and television, Fort Lee, N. J., Chicago, Ill., Hollywood, Calif.

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APRIL 1962

VOLUME 37 NUMBER 4

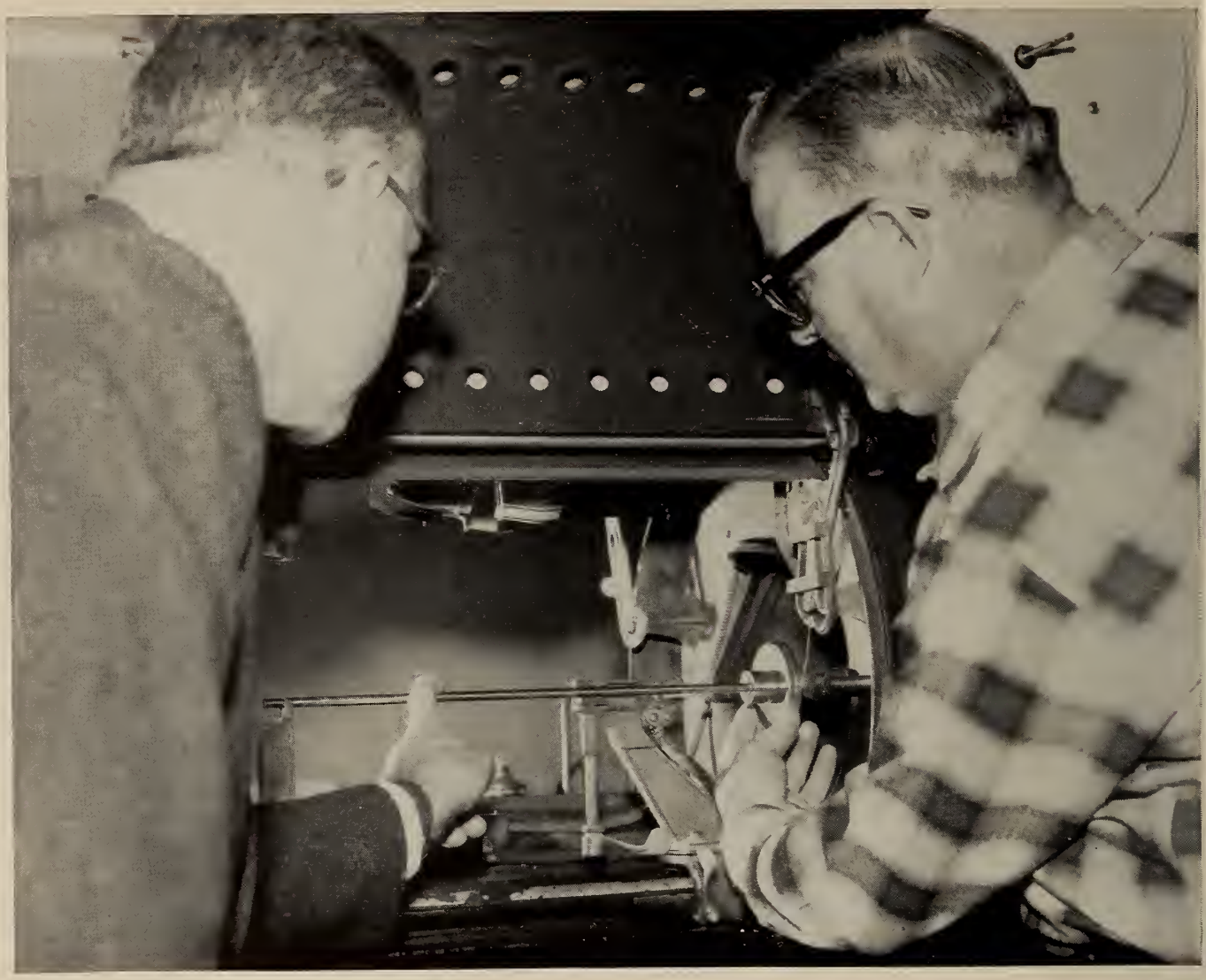
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LOS ANGELES, CALIFORNIA, APRIL 29 - MAY 3

SECTION BEGINS ON PAGE 8



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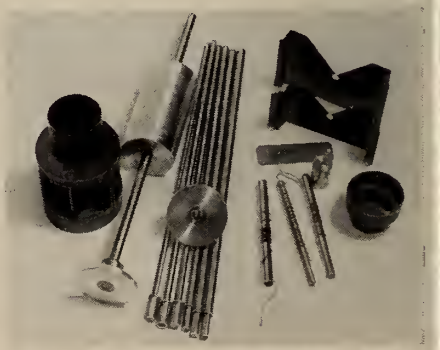
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PROJECTIONIST

Including a special Audio-Visual section relating to the operation and maintenance of A-V equipment in the educational and industrial fields.

Volume 37 April 1962 No. 4

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawsan & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address shauld be submitted four weeks in advance af publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire cantents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

Theatre Projectionists Advancing In Tune to This 'Electronic Age'

That old saw, "necessity is the mother of invention," cuts two ways. The other way is the survival of a workman in his life work.

And when social changes or technological advances threatens a craftsman or a skilled worker, the ambitious man looks about him to adapt his basic training and skills in some of the advancing allied fields to give him an anchor to windward in the changed atmospheric conditions.

Thus, we think, theatre executives would be surprised at the number of theatre "motion picture machine operators" who have developed intimate knowledge of such allied fields as visual education with its slide projectors, sound-film 16 and 8 mm projectors, tape recorders, etc.; cameras, both movie and still, and photography and its processing.

The editors of this journal say that with all confidence on the evidence of theatre projectionists' subscribers inquiry about such allied equipment and processes.

After all, the projectionist is a craftsman, old-timers as well as newcomers to the trade. They are trained in the fundamentals of electricity, and have developed skills in mechanics, sound recording and reproduction, light sources and color. His developed instincts and curiosity about advancements in his craft naturally turns him to study and acquaintance to such allied equipment and its manipulation.

Ever since the post-war shrinkage of conventional movie houses, many theatre projectionists, for survival in their chosen life work, have been developing know-how and skills in such allied fields.

This was a natural development of the theatre projectionist. He has been called upon to sharpen his technological knowledge and skills as multi-track sound reproduction with its complex electronic equipment; new light sources to project the new processes such as Cinerama, CinemaScope, Todd-AO and other wide-screen advances, which followed rapidly in the post war era.

And these electronic developments are continuing, with new gas-filled tubes for projection light sources, transistor sound systems and all the rest of refinements to film projection.

So the projectionist has a new worry about his livelihood as the thinning of his ranks is threatened by machines which have led to automation in the theatres' booths, (as witness several theatres in England with a man sitting at a console in the auditorium controlling focus, sound volume, even changing sequence of the program.)

It's little wonder that the theatre projectionist is an avid reader and student of technical articles and new advances in equipment — whether the machines are for the theatre, visual education, cameras, recorders and sound reproduction and photographic processes.

While many theatres, (in contrast to the showcase houses and newer theatres), in which the projectionist works have outmoded equipment, the average craftsman is looking forward to continuing in his life work, and

(Continued on page 19)

INTERNATIONAL PROJECTIONIST

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Ventilation and Cooling of Arc Lamps

BY ROBERT A. MITCHELL

MODERN HIGH-INTENSITY projection arcs are capable of efficient service and brilliant, steady illumination of motion-picture screens. But they must be properly installed and operated to give satisfactory performance. Carbon trims should not be overloaded (that is, burned at currents exceeding their maximum rated current), and the lamphouses must be kept reasonably cool by adequate ventilation. In certain cases, water-cooling of the carbon jaws, themselves, is an essential part of arc-lamp operation.

Now, there are three cogent reasons why projection arc lamps should be properly ventilated and cooled. First of all, the combustion gases produced by the high-intensity carbon arc are so poisonous and detrimental to the health of the projectionists that they must be con tinuously removed from the lamp and expelled from the projection room. Second, a properly ventilated arc burns better — cooler, brighter, and steadier. Third, adequate ventilation and carbon-head cooling greatly minimize damage to the reflector, the burner (carbon jaws and feeding mechanism), and other parts vital to satisfactory operation of the lamp.

Do Not Overload Carbons!

Arc-lamp ventilation is a critical matter in drive-ins and other large theatres. High arc amperages generate tremendous quantities of power to be dissipated in the form of heat. Naturally, no amount of lamphouse ventilation and burner cooling will improve matters when the carbons are overloaded. We must presuppose, therefore, that projectionist readers of IP do not make the common mistake of burning carbons above the rated current capacity. To do so invites damage to the lamps and operational troubles aplenty. We do, however, highly recom-

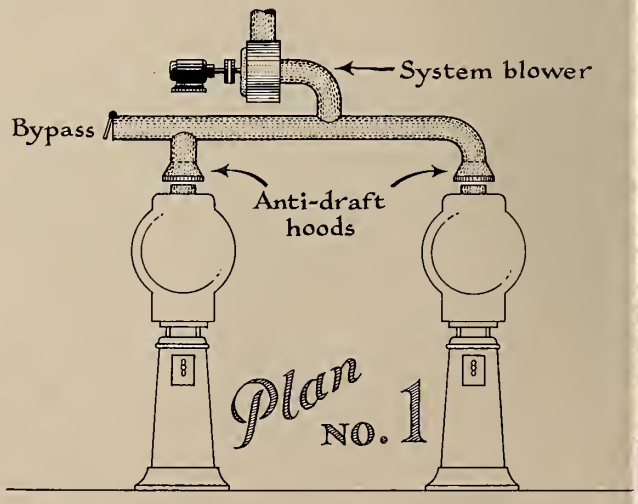


FIG. 1 — A sotisfoctory gos-exhoust ventiloting system with onti-droft hoods ploced closely over the orc-lomp chimneys without o gos-tight connection. The use of hoods is recommended only for the smoller Suprex-type lomps ond for the lorger rototing-positive models hoving built-in blowers which work independently of the moin vent-system blower. Note the byposs regulotors which ore preferred to "stovepipe" dompers.



FIG. 2 — A vent system employing an interesting madificatian of the anti-draft haod. Observe thot the lamp vent pipes lead to apenings in the main exhaust duct without gas-tight cannections.

mend burning all trims of carbons at their maximum rated current for the brightest, whitest light.

We have observed owners of small drive-ins install Suprex lamps discarded by indoor theatres with the insistence that the projectionists burn the carbons at 5 or 10 amperes above the rated maximum "for more light." Well, these misguided souls get very little extra light by overloading the carbons, but what they do get is a flickering, discolored light, a tremendously accelerated carbon consumption, erratic feeding, frequent mirror breakage, corroded carbon jaws, and ruined lamps.

Very few theatres today still use old-style low-intensity arcs, but many of us remember them well. LI carbons burn very slowly and generate relatively little gas. Moreover, LI-arc gas consists mostly of carbon dioxide with only small amounts of the dangerously poisonous oxides of nitrogen. Lamphouse ventilation was a minor problem in the days of low-intensity projection. Our chief worry was down-drafts which, on windy days, would blow the arcs out.

The writer has worked in a few theatres in which there were no vent-pipes at all — the arc gases simply poured into the projection room to be removed by the main ventilating system.

HI Arc Gas Dangerous

The gases produced by high-intensity carbon arcs, on the other hand, are very harmful. The carbons burn to carbon monoxide (poisonous) which is further oxidized in the tail flame to carbon dioxide (non-poisonous). This gas is therefore no problem. But the HI arc "fixes" the oxygen and nitrogen of the air to form nitric oxide, which is itself spontaneously oxidized by further contact with the oxygen of the air to form nitrogen dioxide. This lethal gas reacts with moisture (as in the lungs) to form a virulent mixture of nitrous and nitric acids. As a poison, HI-arc gas is peculiarly insidious.

Nitrogen dioxide, the same gas which caused most of the deaths resulting from nitrate film fires, has a delayed action. Hours, days, or weeks may elapse between exposure to a fatal concentration and death from the ensuing pneumonitis,[1] atelectasis,[2] and emphysema.[3] An "allowable" concentration of nitrogen dioxide is generally reckoned as about 40 parts per million; directly dangerous concentrations begin at about 125 p.p.m.

A small Suprex-type HI arc lamp will bring the concentration of nitrogen dioxide in an unventilated room of 1,000 cubic feet to 125 p.p.m. in the time it takes to run a newsreel. *One of the initial symptoms of overexposure to nitrogen dioxide is persistent headache.*

Air-Flow Recommendations

Adequate ventilation of low-intensity lamphouses is probably assured by a blower which exhausts 40 to 50 cubic feet per minute from the main vent-pipe to the outside air. This is not nearly enough for high-intensity lamps, however. About 400 cu. ft./min. is recommended for low- to medium-amperage HI lamps; 700 cu. ft./min. for medium- to high-amperage HI lamps including lamps of the "blown-arc" type.

The actual amount of air passing through each lamphouse when these recommendations are followed will, of course, depend upon the adjustment of the bypass dampers installed in the duct system for regulating the amount of draft or for buffering down-drafts which might cause the arcs to waver and give a flickering light.

Strong Electric's Test Gauges

The Strong Electric Corp. furnishes ingeniously simple "draft gauges" to enable the projectionist to test his lamphouse ventilation for effectiveness without the use of expensive velometers. The lighter of the two Strong gauges, made of cardboard, is for use with lamps burning 75 to 105 amps., while the heavier aluminum gauge is for lamps burning 110 to 135 amps. The instructions printed upon these flat rectangular Strong gauges are self-explanatory:

1. Open doors of all lamps in booth, open wide all dampers either in lamp or ducts, and close all bypass openings in duct, so maximum air will be removed from lamphouse.

2. Holding this gauge flat in a horizontal plane, bridge the chimney exit opening from the bottom of the opening on the upper inside of the lamp.

3. If gauge will remain held up in this position by velocity of air flow, it indicates that the exhaust suction

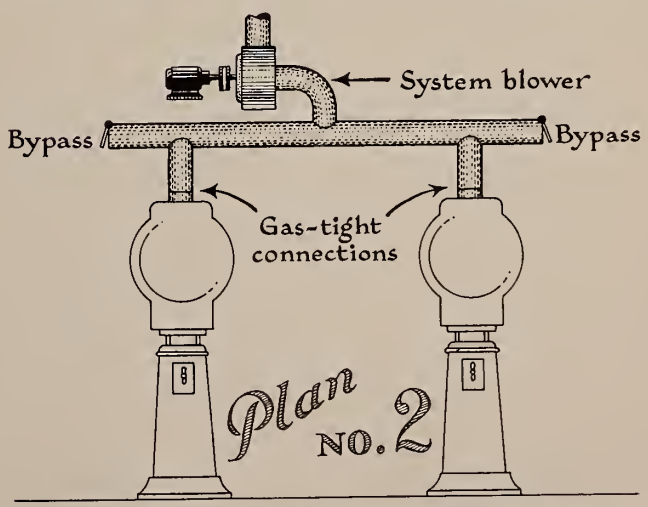


FIG. 3 — The opproved exhaust system having gas-tight connections ta the lomps. Bypass regulators are used insteod of dampers. This system, recammended for all mokes, models, and sizes af arc lamp, shauld have an exhaust capacity af at least 400 cubic feet per minute far orc currents up to obout 105 amps.; 700 cu. ft./min. for currents of 110 amps. or higher.

[1] **Pneumonitis:** Inflammation of the lungs. **(Stedman's Medical Dictionary.)**

[2] **Atelectasis:** An airless condition of a portion of a lung due to the pressure of a pleural effusion, blocking of the smaller bronchial tubes with mucus, etc. **(Ibid.)**

[3] **Emphysema:** Dilatation of the pulmonary air vesicles, usually through atrophy of the septa between alveoli. **(Ibid.)**

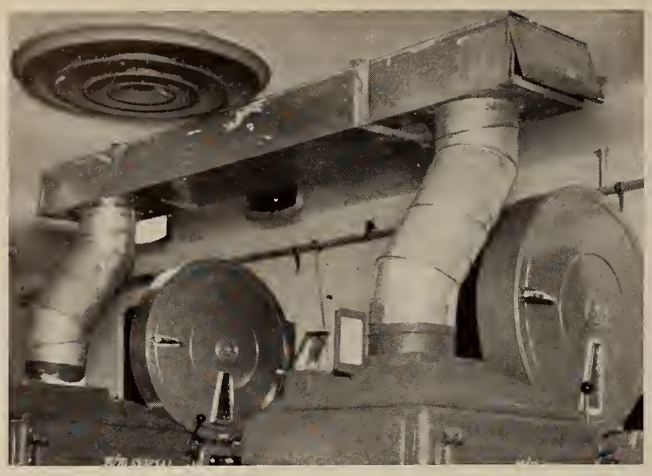


FIG. 4 — Solid gas-tight connection of the orc-lomp chimneys to the exhoust system. Note especially the bypass regulating dompers in the ends of the overheod ventiloting duct.

system is meeting the minimum requirement of 400 (or 700) lineal feet per minute necessary for arc currents of 75—105 (or 110—135) amperes.

4. If gauge is not held up by velocity of air flow it indicates exhaust suction system is inadequate for arc currents of 75—105 (or 110—135) amperes and that the fumes or products of combustion are not being properly removed, and that reflector discoloration or breakage or general lamp overheating will be experienced.

5. Repeat this test for each lamp.

6. Consult other detailed instructions regarding proper exaust draft systems and their adjustment.

Dampers and Vent Connections

Both of the leading American manufacturers of projection lamps, Ashcraft and Strong, do not approve of "stovepipe" dampers in the vent pipes. Instead, bypass regulators are preferred for controlling air-flow and buffering down-drafts.

Ashcraft allows an anti-draft hood over each lamphouse in place of a gas-tight pipe connection, while Strong seems to favor connecting the vent pipes directly to the lamp outlet chimneys as the more effective method of insuring satisfactory ventilation of the lamps and preventing the escape of noxious gasses into the projection room.

The writer is inclined to believe that closely positioned anti-draft hoods over the lamp chimneys (not gas-tight) are satisfactory for low amperage Super HI lamps and for higher powered lamps having built-in lamphouse blowers which work in conjunction with the independently functioning vent-system blower.

Among the lamps having motorized lamp-ventilating blowers are the Strong Super "135", U-H-I, Jetarc, the National Ventarc, and the Ashcraft Cinex and Super Cinex. All other lamps, including obsolete condensing-lens models, should be connected directly to the vent pipes if they burn more than 85 or 90 amps.

HI Core Dust Harmful

The presence of dust in arc-lamp fumes is considered a health hazard by many authorities, not because the dust is toxic (it isn't), but because continuous breathing of dust-laden air over long periods of time may induce a dangerous form of tuberculosis known as "silicosis."

The danger was not too acute in the days of low-intensity arcs. LI arc dust contains about 1½% of silica (silicon dioxide), the insoluble agent known to cause silicosis. The rest of the dust is largely soluble potassium carbonate (potash) and caustic potassium oxide, compounds which are irritating but not poisonous. Dust from high-intensity arcs is very different in composition.

HI arc dust contains less than 2% of silica. About 75% of the dust consists of rare-earth oxides and fluorides. These are insoluble (as is silica); and it is the *insoluble character* of these fine dusts, not their chemical character, which is responsible for causing silicosis. The silicosis hazard of HI arc dust is very real, and hence must be regarded as an additional reason for complete removal of the arc gases by efficient lamphouse ventilation.

Projection arc lamps last much longer and give consistently better results operationally and lightwise when *all* effectual means are employed for cooling the reflector, the carbon burner, feed mechanism, and all other operating parts.

Although adequate ventilation of the lamphouse has a desirable cooling effect, and is necessary for the disposal of harmful arc gases, it cannot appreciably lower the temperature of the intensity hot carbon jaws or advancing mechanism in rotating-positive lamps. To improve the burning of the arc and to preserve the burner from rapid deterioration, therefore, the positive carbon head or jaw must be cooled by flowing water.

Huff Coolers for Suprex Lamps

Water-cooled carbon jaws are an absolute necessity in arc lamps burning more than 85 or 90 amps., and are beneficial even in Suprex-type lamps ("simplified" high intensity) burning from 60 to 80 amps. As a matter of fact, water-cooled jaws in Suprex lamps make it possible, in many cases, to use the *next smaller* trim of carbons burned at a current which is lower, but *maximum for the smaller trim.* This expedient results in more projected light and a brighter, more uniformly illuminated, and definitely whiter picture.

An example can be given. When Huff Suprex coolers are installed in Peerless Magnarc lamps burning the 8 & 7 mm trim at 60 amps., and the carbons changed to the 7 & 6 mm trim burned at 50 amps. (maximum for this trim), total screen illumination increases to 130% of its former value without the Huff coolers.

The explanation of this spectacular improvement is simple. Water-cooled carbons burn with less pencilling of the positive, hence the crater is wider and flatter and more uniform in luminosity over its area. In consequence,

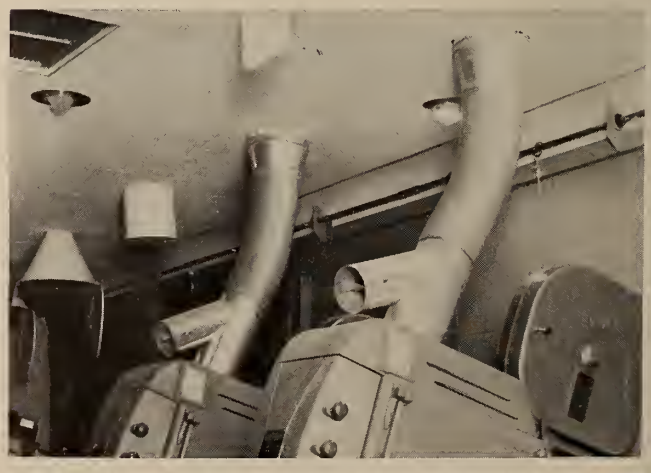


FIG. 5 — An unusual, but effective, placement of the byposs regulators in offsets from the lomp-ventiloting pipes.



FIG. 6 — A water circulator for the water-cooled positive-carbon head of the arc lamp.

light on the screen is more uniform, and it is definitely brighter and whiter when the carbons can be burned at their maximum rated current. And with less of a "hot spot," there is also less danger of blistering the emulsion in the middle of the film-frames.

Rotating-Positive Head Cooling

Modern Strong and Ashcraft rotating-positive reflector lamps burning from 75 or 85 amps. upward are equipped with water-cooled solid silver contact heads (which, by the way, should be cleaned by brushing, and *NEVER* filed or sandpapered—the silver "tarnish" is an excellent conductor of electricity and should be left on).

The water for these carbon heads may be drawn from the city mains, although this is not usually recommended, and may actually be detrimental to the silver castings if the water be hard or chlorinated. Each such Strong or Ashcraft lamp, therefore, is furnished with a motor-driven circulator designed to recirculate 1 or 2 pints of distilled water per minute through the hollow casting of the positive head.

With one exception (mentioned anon), the water outlet of an Ashcraft or Strong circulator may be connected to the water-cooled film-gate casting of the projector mechanism, if water-cooled apertures are used. The outlet of the water-cooled gate is then connected to the arc-lamp positive head. and thence back to the circulator. Likewise, if circulators such as the National Aquaflow are already in use for the projector apertures, the water may be conducted through the arc-lamp positive head to do double duty before heing returned to the circulator. In every case, the water hoses are connected so that the water is pumped through the projector aperture first, and then to the arc lamp.

The water inlets and outlets of arc-lamp positive heads are connected hy means of ruhber hose, not metal tubing. Metal would ground the arc-lamp carhon hurner and cause a serious short-circuit.

The one exception to "double duty" use of water circulators, noted ahove, is the powerful "hlown-arc" type of lamp. The type of water circulator heretofore used with regular Hl lamps burning 13.6-mm carbons is not adequate, as the amount of energy collected from the positive and negative in the hlown arc is douhle that collected in a 13.6-mm lamp. A minimum water flow of 2 pints per minute is required no matter whether the circulator or mains water be used. The projector cooling *should not* be connected in series, but supplied separately when Strong Jetarcs or National Ventarcs are installed.

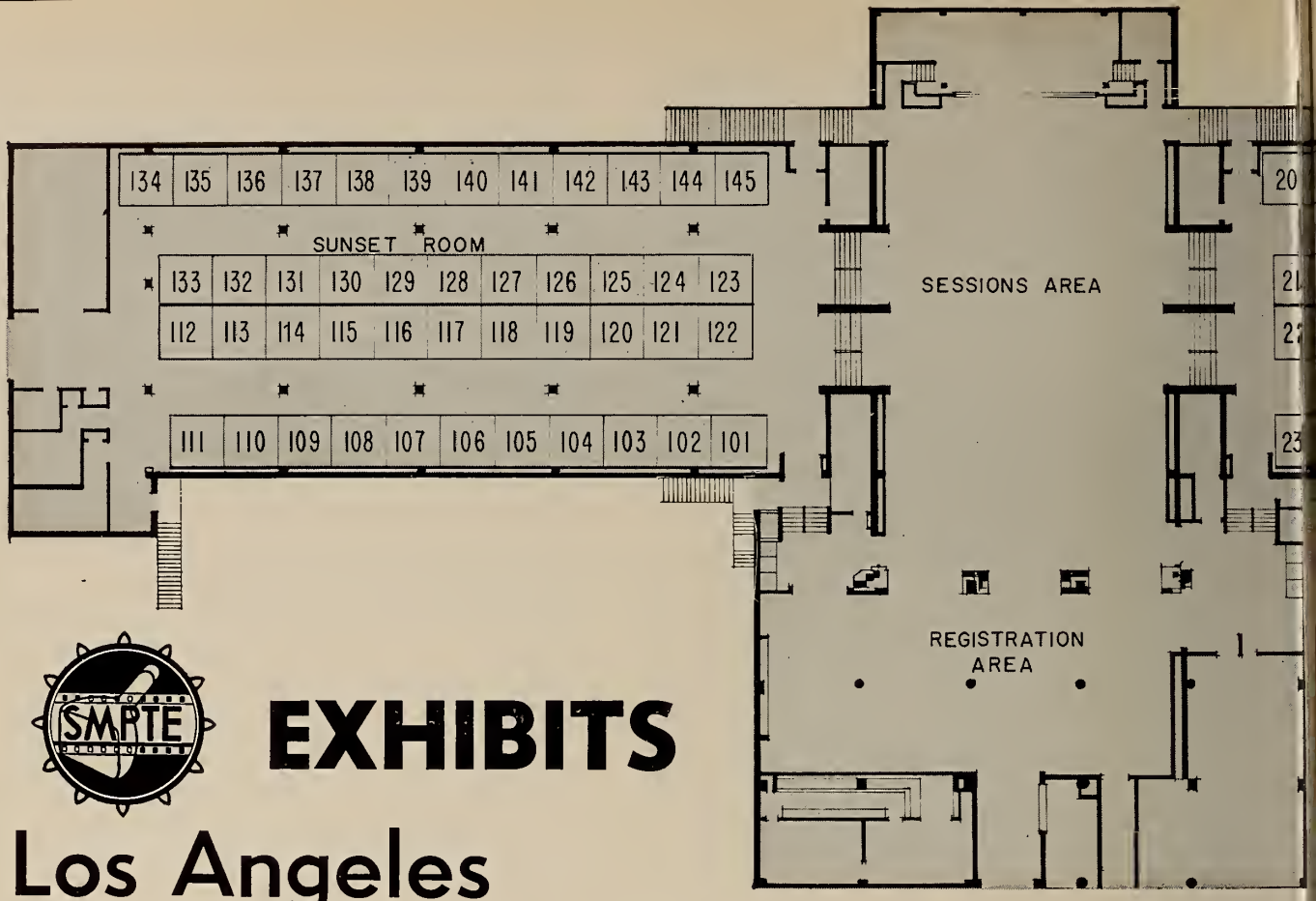
If you are already using water cooling in your arc lamps, chances are that the carbon jaws are correctly supplied with water from suitable circulators. Lamphouse air ventilation is a different matter, more critical, and requires periodic checking to make sure that it functions effectively at all times for the hygienic well-being of the projection crew and the physical well-heing of the lamps, themselves.

Next Month In IP

Projection practices, including practical demonstrations and panels on the proper utilization of motion picture projection equipment, will be fully discussed at the current convention of the Society of Motion Picture and Television Engineers in Los Angeles.

This is the first meeting in several years in which practical projection has received examination in depth. There will be something of interest to every working projectionist.

Watch for next issue's first report on the SMPTE projection sessions.



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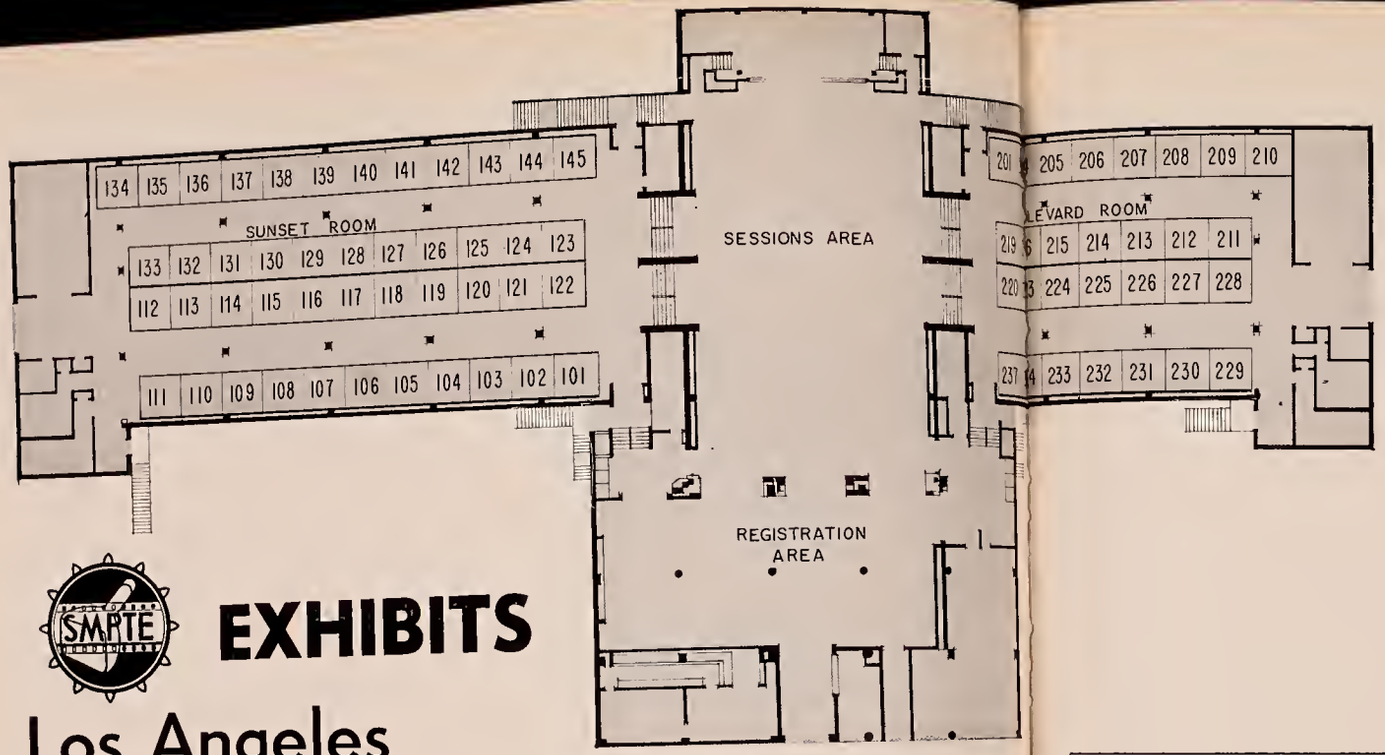
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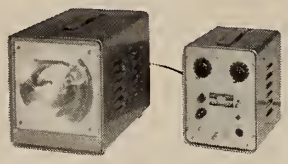
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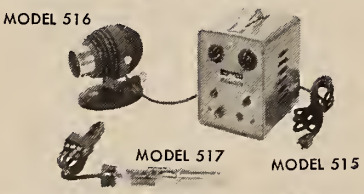


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SMPTE Convention Features Sessions on Projection

LOS ANGELES—More than 1,000 engineers and scientists of the motion picture and television industries will convene in Hollywood April 30 - May 4 to hear 70 research reports on "Advances in Color Motion Pictures and Color Television."

The Ambassador Hotel meeting will also feature the largest exhibit area of new equipment in the history of the society with display space of 14,500 sq. ft.

"Projection Practices"

Sessions on "Projection Practices" at the convention have been shifted to the Academy Awards Theatre to insure top projection facilities, according to Projection Chairman Frank McBrien of MGM studios.

An important feature of the session will be the demonstration of the new liquid gate projection system developed by Eastman Kodak. John Turner of Eastman will describe how this new technique of film presentation eliminates flutter, blur, buckling, and scratches in projection.

Other papers at the session include: "The Projection of Freshly Processed Motion Picture Film" by Don V. Kloepfel, General Film Laboratories; "Development of an Extreme-Wide-Angle Motion Picture System for the Seattle Fair" by William D. Littschwager, Cinerama. Inc.; and "Multifilms in the Theatre and Television, by Harold H Schroeder of Bausch & Lomb.

Kloepfel, a veteran of theatre and laboratory projection, will describe some experiments with materials other than steel that may be used for projector film shoes to prevent emulsion build-up and film sticking.

Disregard of Research

Society President John Servies, head of National Theatre Supply Co., will preside over the opening get-together luncheon at the Ambassador Monday noon, at which Cinerama executive vice president Max Youngstein will deliver the keynote speech, "Hollywood's Disregard of Research and the Price It Has Paid for That Disregard."

In accepting Servies' invitation to address the convention, Youngstein said, "I am delighted to have the privilege of talking before the one group in Hollywood that has fostered the perfection of the art through its constant striving for improved and perfect presentations. Since joining Cinerama, I have for the first time in my many years in motion pictures become associated with an organization that has a research department and that insists on utilizing every resource of research and science to bring to the screen the full beauty of the creator's concept."

Prior to joining Cinerama, Inc., Youngstein had served as vice president of United Artists since 1951.

Littschwager tells of the World's Fair exhibit, "The Spacearuim", which serves as a vehicle for a realistic trip to outer space. The special 160 degree angular field lens in photography and projection is described, as well as a 75 foot domed projection screen.

Schroeder describes the importance of vacuum deposited multilayer coatings in motion pictures and TV and their relationship to brightness and color.

The amount of new movie and TV equipment to be displayed has led to the setting of two sessions for papers and demonstrations of new equipment.

In addition to papers on advances in color and the space and military applications of photography and television, important items on the agenda include discussions and analysis of 8mm sound on film which will make possible rapid expansion in setting standards for the industrial and educational fields; a new liquid gate projector that eliminates scratches, flutter, and blurs; a new high quality color negative and film.

The President's annual cocktail party and banquet is Wednesday night at the Cocoanut Grove with music by Freddy Martin's orchestra and entertainment by Van Johnson in "The Music Man." Wives of the delegates will be entertained with visits to TV and motion pictures studios, the Huntington Library and Knott's Berry Farm, according to Mrs. Harry Teitelbaum and Mrs. Ralph Lovell, co-chairman of the ladies committee.

An extra session on "Closed Circuit Television Equipment and Techniques" at 2:30 p.m. Wednesday, May 2 has been added to the SMPTE

Continued on page 12



FUND RAISER— Local #283 IATSE, York, Penn., has hit upon a means of raising additional funds through the purchase of a Strong Trouper carbon arc follow spotlight which it takes out on special events such as shows and civic affairs which are staged in New York. Shown with the spotlight is Arthur A. Grafton, president of the local.

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Westrex Appoints Recording Engineer

LOS ANGELES—The appointment of Ralph E. Lovell as sales engineer for professional recording equipment has been announced by Ralph Wight, vice president and general manager of the Westrex Recording Equipment division of Litton Systems.

Currently chairman of the Hollywood section of the Society of Motion Picture and Television Engineers, Lovell is a member of the Audio Engineering Society and the National Association of Educational Broadcasters.

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91st SMPTE Convention and Equipment Exhibit

APRIL 29 - MAY 4, 1962

Ambassador Hotel, Los Angeles

SUNDAY, April 29

REGISTRATION—10 a.m.-4 p.m.

MONDAY, April 30

REGISTRATION—All Day

DISTRIBUTION OF INTERNATIONAL PROJECTIONIST OPTICS AND OPTICAL SYSTEMS —Morning

The laser and applications (with demonstration); design of special illumination systems; optical tunnels; large aperture TV lenses.

GET - TOGETHER LUNCHEON — Noon. Guest Speaker: Max Youngstein, Exec. Vice-President, Cinerama, Inc.

LABORATORY PRACTICES AND PHOTOGRAPHIC MATERIALS — Afternoon

New color films; duplication tests; dye stability; standard ratio prints from wide-screen originals; performance of Japanese color film.

SPECIAL TUTORIAL SESSION ON COLOR — Evening

"Chemistry and Color Photography" by Paul Vittum, and "Hue, Saturation and Lightness in Photography and Television" by Ralph M. Evans.

TUESDAY, May 1

INSTRUMENTATION AND HIGH SPEED PHOTOGRAPHY— Morning

The role of motion pictures at Edwards AFB; high-speed practices; improved nanosecond light source.

INSTRUMENTATION AND HIGH SPEED PHOTOGRAPHY— Afternoon

Continued from morning session.

SET CONSTRUCTION AND SPECIAL EFFECTS — Afternoon (Concurrent Session)

Paint technology; set construction; scenic arts; art direction; prop fabrication; staff shop technology; special effects.

TELEVISION RECORDING— Evening

Electron beam recording; present status of thermoplastic recording; new developments in kinescope recording; color recording on video tape; closed-circuit recording systems.

WEDNESDAY, May 2

EQUIPMENT PAPERS AND DEMONSTRATIONS—Morning

New products described and demonstrated by Exhibitors.

TELEVISION EQUIPMENT AND TECHNIQUES—Afternoon

New vidicons; new color cameras; 3-D television; slow-scan narrow-band systems; wide-band system; closed-circuit system for nuclear reactor maintenance; television intercom systems.

COCKTAIL PARTY, BANQUET AND DANCE — Evening

THURSDAY, May 3

SOUND RECORDING AND REPRODUCTION—Morning

Status of the sound recording art; electronic music in theatres: varidirectional condenser microphone; camera power system; standardization of variable-area printing.

PROJECTION PRACTICES — Afternoon

Projection automation; status report on 35mm and 70mm entertainment systems; projection of fresh film.

FRIDAY, May 4

EDUCATIONAL AND INDUSTRIAL FILMS—Morning

Survey of motion-picture courses in American colleges and universities; film documentation of orbital flights; educational use of video tape.

CINEMATOGRAPHY AND PRESENTATION SYSTEMS— Afternoon

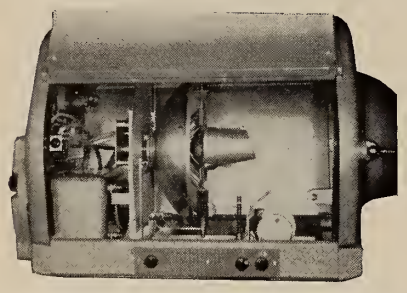
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convention program, according to Papers Chairman Ed Ancona, as the result of a last minute flow of significant papers. Convention at the Ambassador Hotel April 30 - May 4 also features a session at 2 p.m. Thursday, May 3, on "Television Equipment and Techniques."

Ampex Corp. will introduce new telecasting accessories in its VR-1000 Videotape recorder and Ampex's own Video-Tape, as well as showing such previously introduced items as its Marconi Mark IV television camera, its electronic editor and its VR 1000 C Video-Tape recorder.

Secrets of the art skills that enable Hollywood to create the thousand and one wonders of the world within a studio will be revealed at a special session.

Dr. Herbert Meyer, formerly of the Motion Picture Research Council, will serve as chairman for the Tuesday afternoon discussions on "Set Construction and Special Effects" at which a group of experts from Hollywood's major motion picture studios will deliver papers.

Centering on non-photographic aspects of production, the talks will describe the functions, special materials, technologies and skills behind the camera that give Hollywood its unique leadership in production quality.

The speakers and their papers include: Walter Jolley, 20th Century-Fox, "Paint Technology"; George Gibson, MGM, "Scenic Art in the Motion Picture Industry"; Ivyl Burks, Paramount, "Materials and Processes for Prop Fabrication"; Ivan Martin, 20th Century-Fox, "Scope and Function of Motion Picture Set Construction"; Preston Ames, MGM, "Art Direction"; Fred Ponedel, Warner Brothers, "Special Effects"; Carl Stout, Columbia Pictures, "Staff Shop Technology". **iP**

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Unions Take Lead In Fighting Runaway Picture Production

HOLLYWOOD — The executive board of the 3,200-member affiliater property craftsmen, Local 44, yesterday recommended a one dollar per month assessment for six months for a positive action program against runaway production, B. C. "Cappy" Duvall, business representative and a vice president of the Los Angeles County Federation of Labor, announced.

Mounting Hollywood support for a boycott of runaway film production was evidenced when the 2500-member AFL-CIO Laboratory Technicians Union, Local 683, IATSE, unanimously voted to earmark $2500 from its general fund for the fight to save the motion picture industry for America, Don Haggerty, the union's business representative, has announced.

The action followed a talk by Clayton Thomason, business representative of Scenic Artists Local 816, IATSE, which last week voted a minimum assessment of $1 a month per member for a fund to be used by the Hollywood AFL Film Council for a positive action program against runaway production.

The planned boycott of American-interest films made overseas is one phase of the campaign, Haggerty said. The unions will also urge consumer box office support of all films made in America.

"Runaway production of theatrical features has drastically exported Hollywood employment with resultant hardship and distress and is a huge loss to the American economy," Haggerty said. "Runaway production has ranged up to 60%, including many multi-million dollar pictures. The unions have been waiting patiently for some concrete result from continuing conferences with management, while the flight of production which began several years ago continues to increase. The unions' rank and file demand action."

It is estimated that if all Hollywood unions join the campaign, funds amounting to more than $20,000 a month would be available to the Hollywood AFL Film Council to prosecute the program "to prevent Hollywood from becoming a ghost town."

Hollywood unions are setting up a fund to be administered by the Hollywood AFL Film Council "to save the Motion Picture Industry for America." They include the Laboratory Technicians Union 683 which voted an initial fund of $2500.

And in addition, H. O'Neil Shanks and Charles S. Boren, co-chairman of the Joint Labor-Management Committee on "Runaway" Productions have outlined the plan which has resulted from IA Unions pointing out the danger:

"Since Feb. 1, 1962 representatives of labor-management in the motion picture industry have held a series of joint meetings to seek constructive means to solve the problems of foreign competition with American film production and to encourage increased feature film production in Hollywood.

"From the beginning of the meetings it has been apparent to both labor-management that this is a difficult and complicated economic situation that cannot be solved by any quick or drastic remedy.

"Optimism over the possibiliy of any major immediate results in the efforts to increase domestic production would be unrealistic.

"The Joint Committee intends to take cooperative action in the following areas:

"1—A petition to the Small Business Administration seeking a change in the current SBA policy against making loans to communications industries.

"2—Joint support of proposed federal legislation which would limit tax exemption for Americans living abroad to $20,000 per year for the first three years and $35,000 per year thereafter.

"3—Support for federal legislation which would permit the spread of income over a period of years for persons engaged in activities (such as acting) in which the maximum earning power is relatively brief and often spasmodic. It is hoped that such legislation would cause popular stars to make a larger number of films.

"4—Support for measures aimed at reducing extravagant tax-free expenses allowance given to creative personnel working abroad.

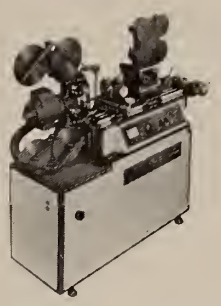
"5—Efforts through appropriate agencies — such as organizations for economic cooperative development and the general agreement on tariff and trade — to remove unfair trade barriers and competitive disadvantages which handicap American production.

"6—A cooperative analysis of cost differentials between Hollywood and foreign film centers."

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PROJECTED HIGHLIGHTS

By Ray Gallo

The *91st SMPTE Convention* now in session at the Ambassador Hotel in Los Angeles is the Society's largest attended in many years. The 80-exhibit Symposium has attracted delegates from all over the world. From the *Society of Motion Picture Engineers*, founded in 1916 by a handful of film scientists, it has grown to a membership of nearly 10,000 representing engineering leadership in every branch of motion pictures, television, photography, recording and many related arts and sciences. It is administered by a board of governors and officers under the direction of *John W. Servies*, its present president and *Charles S. Stodter*, executive secretary. It also has a sustaining membership of over 150 leading companies whose chief activities are closely related to the Society's objectives. As an organization to advance theories and practices, it has maintained high standards all over the world. The dissemination of the scientific knowledge is expertly supervised by an editorial board which channels its technical information through its monthly "Journal" that is ably edited by *Victor H. Allen*. *Harry Teitelbaum* of *Hollywood Film Company* did a wonderful job as convention vice president and was assisted by *George Kendall* as exhibit chairman, and *Edward A. Ancona, Jr.* as program chairman. Editorial vice president *Glenn E. Mathews* supervised a splendid program of events. *Frank Zucker*, head of Camera Equipment Co., who organized *New York Local* #644, an IATSE Eastern cameraman's unit in 1914, was recently elected a vice president. Frank started his career with the old *World Film Co.* in Fort Lee, New Jersey (the late William A. Brady's producing unit which later starred his daughter, *Alice Brady*, in pictures). *Gene Levy* is now the executive vice president of Camera Equipment. The Superscope Variable Anamorphic Lens has been acquired by *SOS-Photo-Cine Optics, Inc. J. A. Tanny* is still head of the outfit formerly known as SOS Cinema Supply Corp. now in its 33rd year. SOS is also known world-wide as the "Department Store of Motion Picture Equipment." The *U.S. Air Force* has awarded a $2 million contract to GPL division of *General Precision, Inc.* for aero flight and test equipment. GPL is the parent company of many subsidiaries including *National-Simplex* of which *John W. Servies* (present SMPTE president) is vice president. *Jack Bernard*, sales manager of *Rapid Film Technique*, has just completed an inspection trip of various 16mm audio visual exchanges, and reports that prints are getting more rugged use today. Many of them are being renovated by "Rapidweld" and "Rapidtreat" which removes scratches and applies protective coating. Bernard is known around most film centers as "The Film Doctor." *W. J. German, Inc.*, agent and distributor for *Eastman* professional film, has opened a brand new midwest branch in Chicago's new "Loop End Film Row." *L. A. Bonn* is their Eastern Technical Vice President. M-G-M in association with the Kalvar Corp. is constructing a brand new ultra modern plant in Hollywood to enlarge their new "chemical free" system to make release prints. This revolutionary process eliminates the use of chemicals to develop prints and makes them from any negative instantly. National Studios, America's largest manufacturer and creator of special effects slides, celebrates its 50th anniversary next month by opening a larger department for theatre and television slides, under the direction of *Sonny Rosenberg*, son of *Herman Rosenberg*, founder and still operating head. *John A. Mauer*, SMPTE Fellow and head of *J. M. Development, Inc.* recently demonstrated a new photographic system on a *Kodak* 8mm Magnetic Sound Projector to prove that it offers an advantage in cost as compared to magnetic tracks in all applications requiring a large number of release prints. The *Hurley Screen Company*, founded by the late *Albert Hurley* (SMPTE member) is still being operated by members of his family. He designed the first sound motion picture screen for *Western Electric* when that company developed the first theatre sound system. A Hurley screen has been in use in *Radio City Music Hall* for many years. (They install a new one almost every year). The first American-developed new light source for motion picture projection on the use of Xenon gas discharge has been demonstrated in Toledo by *Arthur Hatch*, head of *Strong Electric Corp.* It will be on display at the current SMPTE convention. The *Zeiss-Ikon Xenon* projection lamp is being exhibited at the SMPTE trade show by its U.S. distributor, *Cine Electronics System, Inc.* Since *Century Projector Corp.* first introduced the Transistor Theatre Sound System about 1960, many firms have been interested in its auditorium value. *Eprad* of Toledo recently acquired a similar development from a Minneapolis firm and plans to enter the theatre market soon. *Dave Joy*, formerly with *National Carbon* has just returned from a world trip with his wife and is now showing special photo-slides to his friends. *Bud Ashcraft* of *C. S. Ashcraft Mfg. Co.* is getting ready to announce a most revolutionary new projection development just invented by his father, *Clarence S. Ashcraft*, dean of projection lamp designers. Many TV commercials on film and some of the better animated theatrical cartoons are made on the famous "*Oxberry*" line of special effects equipment. The firm, *the Animation Equipment Corp.*, had its technical beginning in London, England. Its U.S. headquarters are in New Rochelle, N. Y. *Edward Willette* heads this operation. *Walter Elterman*, president of *Plastic Reel & Core Co.* and *Lee Jones*, head of *Neumade Products Corp.*, have just concluded an agreement whereby Neumade will distribute the new "Plastic Reel." It can be seen for the first time at the SMPTE convention, Dr. Harold Edgerton, SMPTE Fellow and an MIT professor, has specialized in highspeed photography equipment development and makes the top grade electronics lighting devices for Xenon flash. He also heads the firm of Edgerton, Germeshausen, & Grier, Inc.; of Boston, Mass. **iP**

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Free Carbon Chart

Joe Engle, John Vitale Of IA640 Killed

NEW YORK — Joseph W. Engle and John Vitale, both members of Local 640, Nassau and Suffolk Counties, Long Island, died of injuries following an auto accident on Route 33 near Freehold, N. J., March 29.

Joe Engle, a charter member of 640 and a past president and business agent of the Local, died in the Fitkin Hospital, Neptune, N. J., on March 30. Engle was a member of the 25-30 Club and served as president during 1961. He was 69 and worked at the Calderone Theatre in Hempstead, L. I.

John Vitale, 59, died in the ambulance. He was a projectionist at the Skouras Syosset Theatre, L. I.

iP



Braverman Named To Plastic Reel Post

NEW YORK — Walter Elterman, president of Plastic Reel & Core, Inc., has announced the appointment of Allen Braverman to the position of national sales manager.

Mr. Braverman's background includes serving as a packaging engineer for IBM, as sales engineer for Disogrin Corp. and for four years served as an inspection and design officer for the U.S. Navy, assigned to such projects as nuclear submarines, guided missile destroyers and the Kitty Hawk project.

Mr. Elterman also announced the selection of Associated Screen Industries, Ltd., Montreal, Canada, under the direction of Murray Briskin, as Canadian distributor for the company.

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- Rectifiers
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- Zoom Lenses, etc.

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More Norelco 70mm Projectors Installed

NEW YORK — Two more leading theatres are installing Norelco 70/35 projectors, it was announced by Niels Tuxen, general manager of the Motion Picture Equipment division of the North American Philips Co.

In Los Angeles, the 4-Star Theatre had its new equipment ready for an engagement of "Black Tights." The Century Theatre in Minneapolis, a Cinerama showcase for many years, is again operated by the Minnesota Amusement Co., who purchased its Norelco equipment through the Minneapolis branch of National Theatre Supply Co.

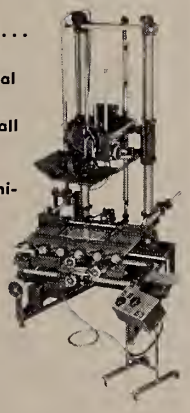
With these two new installations, more than 130 motion picture theatres in the U.S. will be equipped with Norelco 70/35 mm projectors, including a number of drive-ins.

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Rotker Convalescing

NEW YORK — Morris Rotker, recording secretary of the 25-30 club, is convalescing from major surgery at his home in the Bronx. Though he abandoned his career of 51 years as a projectionist in 1958 to become secretary of a municipal court judge in the Bronx, Rotker has continued to be very active in projectionists circles, as testified by the flood of "get well" messages at Doctor's Hospital and his home from organizations and individuals from all around the country.

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Arthur Lichtenstein



Mrs. Gertrude Lichtenstein

Widow of Founder Traces Origin Of the 23-year-old 25-30 Club

By GERTRUDE LICHTENSTEIN
as told to TOM KENNEDY

So many times I wish that my late husband, Arthur Lichtenstein, could see how his idea for a social club for old time projectionists has flourished, with the 25-30 Club's worldwide membership and dedicated men to the ideals of brotherly love, cheering their fellow members when sickness strikes with thoughtful messages and welcome gifts, messages of sympathy when death darkens their family, and the good fellowship and interesting discussions at the Club's meetings and social affairs.

I am sure that Arthur Lichtenstein's love of mankind would draw deep and sincere satisfaction to be one of the founders of the 25-30 Club which is now in its twenty-third year.

In the late fall of 1938, my husband asked "What do you think of having a social club of Union 306 old time members?"

I replied that the idea sounded good to me. After all I came from a theatrical family and our social life was with friends in the New York projectionists local, of which my husband was one of the founders.

I was about to ask Arthur if he had thought up a name for his club idea but he anticipated my query by saying "the name fill be the 25-30 Club, meaning a member should be in the union 25 years or more and in good standing. It will be a purely social club for old timers to get together in good will and friendship and the proceeds to go to sick and relief fund.

"I will see my friend Mike Berkowitz and see what he thinks of the idea."

In 1939 the 25-30 Club was organized with Mike Berkowitz as president, Morris Rotker, vice president; Morris Klapholz, secretary; Harry Sherman, chairman of the membership committee; Henry Weinberger, toastmaster; Abe Kessler, treasurer; Joe Abrams, trustee.

Since my husband died in March, 1942, the brightest events of my widowhood are among those honors and kindnesses I have received from my old friends of the 25-30 Club; pretty cards and flowers on my birthday, the only lady life honorary member, and so many honors, but best of all the 25-30 Club has never forgotten the name Arthur Lichtenstein.

The honorary membership to me I first heard about at dinner in the late Mike Berkowitz' home when he said "I have good news for you, the Club has voted to make you an honorary member." I received a letter later from my friend Morris Klapholz inviting me to the 1946 meeting where the presentation of the honorary life membership would take place.

My mother raised her family never to go to anyone's home empty-handed, so I put on my thinking cap and thought of a bond for the Club in my husband's name, for a nonsectarian home or hospital bed for members of the Club. When I got there President Berkowitz and Harry Sherman of INTERNATIONAL PROJECTIONIST wouldn't hear of the $500 bond. I said to them, think it over, which they did and on Feb. 26, 1946 I was informed that the $500 bond would be accepted with pleasure and donated to the Will Rogers Memorial Hospital at Saranac Lake, in Mr. Arthur Lichtenstein's name as the

Continued on page 18
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Equipment Groups, Exhibitors Plan Trade Show

NEW YORK — Two national theatre equipment manufacturing and sales organizations will join with Allied States Assn., exhibitor organization, for concurrent conventions and a trade show this year, it was announced here.

Theatre Equipment and Supply Manufacturers (TESMA) and Theatre Equipmcnt Dealers Association (TEDA) will join Allied Dec. 3, 4 and 5 at the Sheraton Cleveland hotel.

Larry Davee, TESMA president, said, "he agreed with Marshall Fine, president of Allied, that the trade show and joint conventions of our organizations are to be staged at a time when all indications point to a climate of great theatre business potential.

"Our own directors, at a recent meeting in Chicago, voted unanimously to join with Allied in Cleveland to stage a trade show. Everyone of the 25 or so manufacturers who were present at that meeting stated openly that they would contract for booth space at the show. We feel that these pledges are a tremendous start toward having a capacity show and indicate that when our detailed brochure goes out that we will be sold out in a very short time.

"We join with Allied in welcoming the dealers (TEDA) to Cleveland, too, and hope to have several fruitful meetings with them."

E. H. (Um) Geissler, president of TEDA, stated that he and his organization welcomed the news that Allied and TESMA had concluded their agreement and that the Dealers' organization had wanted the meeting to take place" . . . for the very natural reason that the meeting presents an opportunity for our members to meet with our customers, (Allied) and with the manufacturers (TESMA) whom we represent in the field.

"Our conversations with TESMA lead us to the knowledge that we will be able to meet with them in social and business sessions. These reasons alone, would make us want to be in Cleveland in December. Individual dealers and their manufacturers also will have time to talk together to decide outcome of mutual problems.

"This is the first time in four years that TEDA has had this opportunity, Geissler said, "and our members and our organization intend to make the most of it."

iP

Variable Anamorphic Lenses from SOS

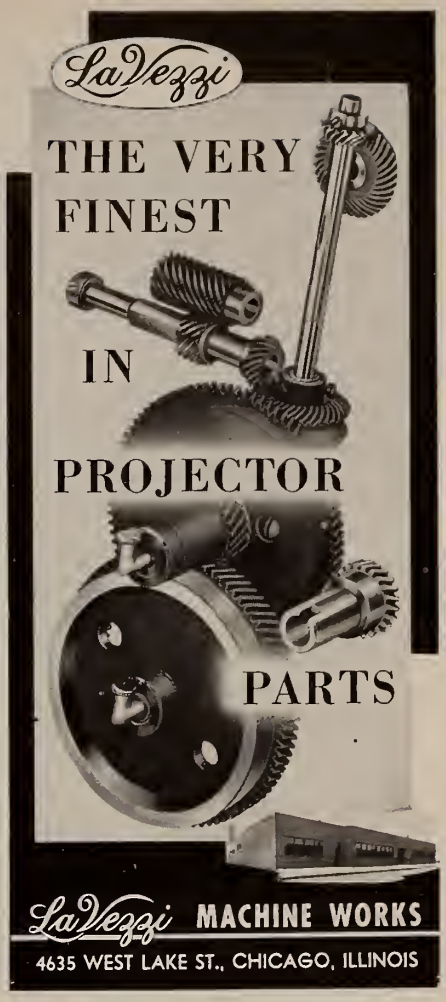
NEW YORK — S.O.S. Photo-Cine-Optics, Inc. is now making Superscope Variable Anamorphic lenses available to theatres and drive-ins. Superscope, it is claimed, utilizes the maximum effect of wide-screen presentation without loss of light or screen height, yet it can present a picture of any screen ratio from zero thru 3 to 1 of extremely fine quality.

The overall composition of the picture is improved resulting in a favorable audience reaction. Superscope does not require a curved screen, and does not impose any restrictions upon screening room sound systems. Screen proportions are changed by turning the proper controls.

With this lens it is possible to switch from one anamorphic system to another or to switch from anamorphic features to standard features. The lens is casily installed with any 35mm back up projection lens.

Originally Superscope sold for $900 but the prices have been radically reduced to $195 a pair. Descriptive literature is available from S.O.S. At 602 W. 52nd St., New York 19.

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25-30 Club

from page 16

founder of the 25-30 Club. On March 11, 1946 I had a wonderful night, as the late Harold Rodner, vice president of the Will Rogers Hospital accepted the bond from me in a glittering capacity crowd which numbered old friends of the 25-30 Club and their wives.

I have many old time friends in the Club, I've mentioned a few names but there were Judge Doragoff, Jacob Kriman, the past presidents Norton, Mackler, Stern, Smith, Anderson, Wolhein, Benjamin, and of course all the officers when the Club was first organized, and many others.

Arthur Lichtenstein at the time of his death was a projectionist with RKO theatres. I have referred that I came from a theatrical family. My father was Cesar Greenberg, who started his acting career on the Jewish stage in Bucharest; my mother was Fannie Greenberg who was of the same troupe. Father, when he came to America became director of the Hebrew Acting School of N. Y., and was the first to lease the Windsor Theatre to put on plays in Yiddish. The Windsor was on the Bowery.

So by inheritance and environment, particularly with my life with Arthur Lichtenstein, I am happiest with people who have backgrounds with the theatre, especially with projectionists and their wives and families.

iP

Century Projector Adds Dallas Sales, Service Organization

NEW YORK — Century Projector Corp. has announced that Modern Sales & Service, Inc., 2200 Young Street, Dallas, Texas has joined the ranks of Century dealers — handling Century projectors and sound reproducing equipment exclusively.

Modern Sales & Service, Inc. is one of the largest and best equipped theatre supply houses in the United States. President is J. H. Elder, whose name for over a quarter of a century has been synonymous with planning, building, equipping and maintaining motion picture theatres. C. C. Hoover is in charge of purchasing and Charles M. McKinney is in charge of sales.

J. C. Skinner, well known electronic engineer for over 30 years, has supervision of a 5-man group of experts for installation, service and engineering for theatres, public address recording equipment, etc.

iP

"PACIFIC PANORAMA"

By Hank Boldizsar

The first two Wednesday nights of each month I make my tour through the great wonders of the Los Angles jungle and finish by compiling this column at Burl's Cafe before the 2 a.m. trek back to La Mirada.

This month's merry-go-round has been especially rewarding—a visit to the Temple Theatre and Harry LeRoy always is. This character,—and I do mean "Character"—is the most fascinating personality it has been my good fortune to be associated with. My favorite fishin' pal—we've spent a lot of time out in the wild Pacific in my tub the "Vind-Yammer"—and a man of the world with motion picture projection tossed in to keep the in-between moments lively.

The good Lord blessed the world with Harry in Lincoln, Nebraska "about" 1905 but this area was not to be his home for long. The elder LeRoy soon acquired a circuit of motion picture theatres in Idaho and the town of Blackfoot witnessed the rise of young Harry to the craft at the tender age of thirteen.

Harry learned the business from the ground up, but the big city beckoned and Harry succumbed. The year 1921 saw the arrival of young Harry in San Francisco where theatre projection rooms kept him employed for several years.

Restless, possessed of unbounding energy and a fabulous "gift of gab" —a person who can hold and entertain his audience for hours on end, Harry soon turned to radio work and from announcing on small stations throughout the bay area he worked his way up to "special features" announcer for CBS. From radio he moved to industry and personnel managerial work for the Devoe & Raynolds Paint Co.

A few years ago Harry came to Los Angles where his footsteps carried him back to the projection rooms in the jurisdiction of Local 150. He expressed a thought to me tonight that I am sure has flashed through the minds of many of us in the craft. Said Harry,—"I'm grateful to the theatre and to the craft, I owe it so much. No one here counts the gray hairs on your head or cares about your age. If you are an accomplished projectionist you've got a good job and a good living as long as you wish to work."—Amen, Harry!

Today Harry, richly blessed with a beautiful wife and daughter, (Thelma and Diane), lives in Pomona. Although it is a long hop from central Los Angeles and the offices of Local 150, you will find this lad attending to his stake in the business of the local.

* * *

"If you see someone without a smile, give him one of yours."

* * *

A stop at the New Follies Theatre to find that Murray Price is still holding down that spot after 15 years of spot-lights on the glamour gals of the "exotic" dance. The "dolls" come and go so fast, but I doubt if a new comic has appeared on the scene during the last 20 years . . . and the material certainly hasn't changed since Eddie Cantor made the Palace and sang "Potatoes are Cheaper." After 15 years of this material, I'm sure Murray has committed to memory every word of dialogue and can light and blackout a scene skillfully without the benefit of a cue sheet.

Carl Bohene replaced this writer at the New Follies three years ago and has settled down to housekeeping in the booth. The Saturday - Sunday shift makes one wonder if he has a home, and I can tell you for sure, fellas', that stuff on stage can wear your good humor awfully thin at times.

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MONTHLY CHAT

from Page 3

thus is acquainting himself with advancements in projection, sound reproduction, light sources, cameras. Not only that, but his pride in his craft is a spur to make the theatre projectionist keep pace with the new developments.

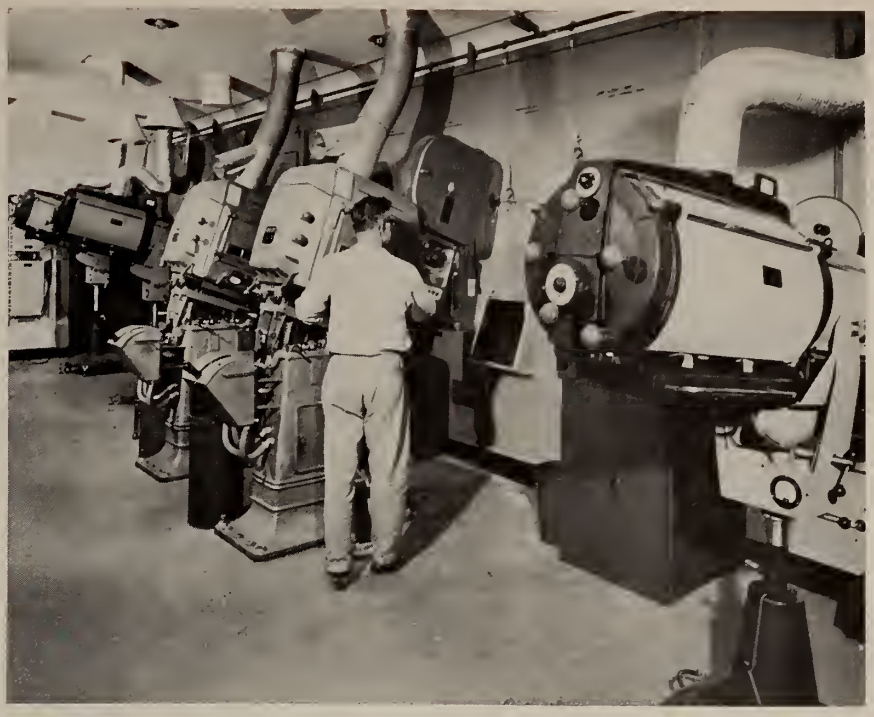
Actually the "theatre machine operator" is a misnomer which has naturally persisted from the early days of the movies. The modern theatre projectionist has know-how and is a skilled technical man in such allied field as public address systems including sound trucks, visual education equipment, recording, movie cameras to film local events, etc. They are fighting for survival of their chosen trade with intelligence, study, ambition and courage.

iP

Strong Electric Introduces New Power Supply

TOLEDO — A new type silicon stack transformer-rectifier that serves as power supply for two projection arc lamps is described in a brochure just issued by the Strong Electric Corp. Associated with each output is a novel "Lo-Strike" feature that protects the silicon stacks from overload and prevents the destruction of the carbon crater upon striking the arc. This Bi-Powr rectifier is available in three ratings, 60-85/60-85, 90-135/90-135, and 120-160/120-160 amperes. A copy of the brochure will be sent to anyone addressing a request to the Strong Electric Corporation, 31 City Park Ave., Toledo 1, Ohio.

iP



AMERICA'S NEW DELUXE PLAYHOUSE—A projection room so well equipped as to be of great interest even to the theatre patrons invited to inspect it is that of the new Fisher Theatre, Detroit, the most pretentious theatre to be built in America in a quarter century. Two projectors with Strong arc lamps for 35 and 70-mm presentations and three powerful Strong Super Trouper carbon arc follow spotlights for stage attractions are shown in this spacious well planned booth. Installation was by National Theatre Supply.

NEW LIGHT UNIT

NEW YORK — Florman & Babb, Inc. has been appointed exclusive distributor of the new Lilliput twin lighting unit manufactured by Kliegl Bros. The Lilliput-Twin delivers the same intensity flood-lighting as a 5KW Fresnel without requiring a booster transformer.

The Lilliput-Twin uses the new 16 hour GE Sealed-Beam Quartz—Iodine Uniflood Lamp and comes equipped with a dim-bright device, and a barn door.

iP

New Projector Gives Slides Continuity

CHICAGO — Bell & Howell has introduced a slide projector that is said to give still pictures the flowing continuity of motion pictures. Called the Tandem-Matic Professional, it features a button on a pistol-grip remote control. One slide slowly fades from the screen as another takes its place which gives a "lap dissolve" effect of a professional motion picture production.

"I think it answers a basic need in the audio-visual and professional fields," said Carl G. Schreyer, Bell & Howell vice president of marketing.

The Tandem-Matic operates on two separate 7-element optical systems, housed side by side in a single unit. Key components of the projector are two 5-inch, f/3.5 lenses which are focused on the same spot on the screen. Synchronized blades gradually close the diamond-shaped iris of one lens while opening that of the other. The entire change-over from one slide to the next takes 1½ seconds. The projector holds 54 slides.

The remote unit, which has a 12-foot cord, contains focus-control and a reverse button, and a light pointer to pick out detail on the screen.

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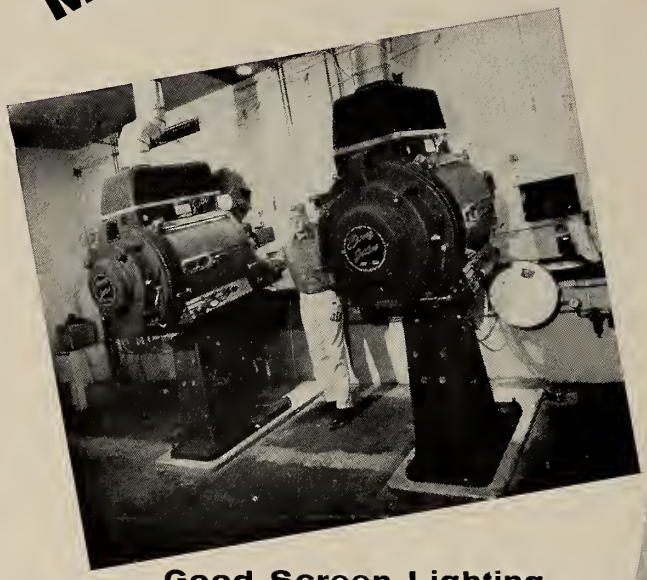
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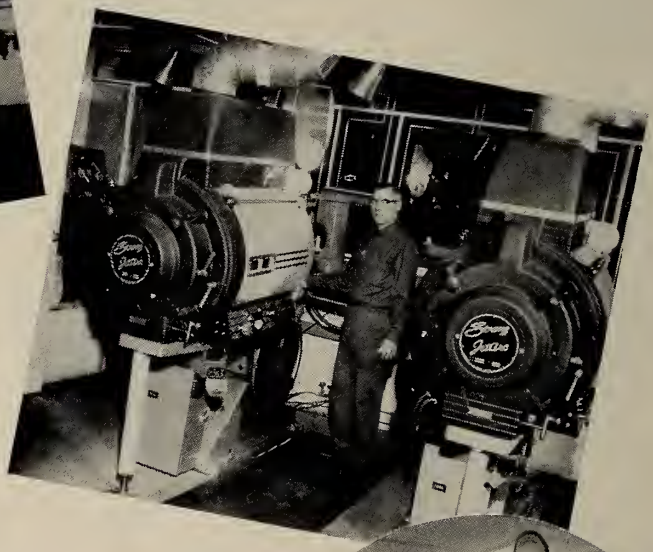
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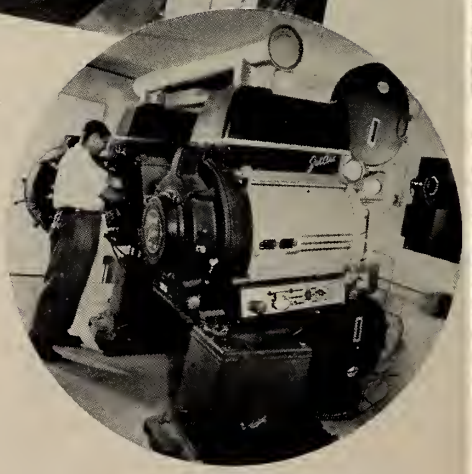


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VOLUME 37 NUMBER 5

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Volume 37 **May, 1962** **No. 5**

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1961 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

BIG OR TV SCREEN, A MATTER OF QUALITY

The present long-range headache for the theatre owner is pay-TV. That is shown by the exhibitors' anti-pay-TV activities, in which the exhibition branch has spent lots of money plus the time of high-paid executivies of the more prosperous circuits.

According to prominent members of the projectionist's craft, when talking about motion pictures vs TV, theatre owners could protect their investments with quality screen presentations to give their customers a contrast between the picture's brightness, definition and scope at the theatre and their home TV set.

Years ago, for example, Lester B. Isaac, when he headed Loew's Theatres projection department, said the best defense for the movie theatre against television was to step up the quality of their projection. That was in the early days of TV, when theatre owners began to worry about the loss of patronage when TV receivers would soon be *in* 2,000,000 *homes.*

Projection Saw the Problem

Many projectionists expressed the same thought, saying exhibition was in the middle of a fight for public patronage and should make movie-going more glamorous with fine screen presentations.

The producer's answer to TV was the bigger picture on bigger screens. But many theatres. in installing their enlarged screen, failed to revamp their projection equipment to provide the additional light needed for their enlarged screen area. Thus, many and many a theatre has rectifiers or generators and arc lamps that just can't deliver a bright and sharp picture on the screen. And many of these theatres depend on steady local patronage where the image and sound quality is the most important prestige factor. Despite the skills of the men in the booth they don't have the equipment to give their moviegoers the subtle lighting effects on black and white and colors that are recorded on the print they project.

Patrons Don't Want Our Troubles

Patrons of these theatres don't know or care where the theatre's deficiency is and conclude that their small screen at home isn't too bad. Whereas it should be the other way around. It could be if the exhibitor would give the boothmen adequate equipment to project on the screen the visual quality that the producer catches with the camera.

The exhibition branch of the industry in its fight against pay-TV would be well to start a propganada drive for good projection and sound in all existing theatres. However, the industry is divided on this subject, since many producers are looking for a rich haul when the box-office-in-the-home comes to pass.

Frank Cooley

INTERNATIONAL PROJECTIONIST

Volume 37 May, 1962 Number 5

COMMON-SENSE...

...Best Film Preservative

By ROBERT A. MITCHELL

MOTION-PICTURE FILM is a unique concentrate of artistic vision, technical effort, and commercial enterprise. Without film there would be no demand for projectionists, no movie theatres, no exhibition industry.

Imprisoned in cans of film are human emotions by the foot, vicarious experiences by the reel, and all the action and color, all the speech and music, all the intense personal communication of the photoplay. And it is only through the art of the projectionist and the magic of his machines that the film, undamaged and unabused, fulfills the destiny envisioned for it by the inspired labor and hopeful faith which created it.

It therefore behooves the projectionist to treat this vital "ribbon of celluloid dreams" with tender care in order that its latent visions of motion and sound be faultlessly materialized in luminous, audible splendor on the giant theatre screen. This is the projectionist's first responsibility. And his second duty is to pass the prints on to the next projectionists in as good condition as possible—unmutilated, unabused, and carefully repaired.

The proper care of motion-picture film involves all the various things that are done to it during its inspection, repair, projection, rewinding, storage, and subsequent shipment. Film can be ruined in any of these projection-room operations. It can also be preserved by intelligent handling, or even improved by conscientious repair of breaks, tears, and badly made splices. Proper cleaning and waxing or lacquering also improve the condition of film, although these are specialized operations not recommended for the projection room.

Now, the proper care of film during all phases of its handling should be based on a sound knowledge of the physical behavior and properties of release stock, not on unverified notions that have been widespread in the industry ever since the earliest days of nitrate stock.

Film "Humidification" A Screwball Idea

Hints and reminders addressed to our brother projectionists anent the conservation of prints during inspection and projection have been given many times in the past, and will doubtless be reviewed in the pages of IP at appropriate epochs of the future. Our present attention is directed to less well known territory, that is, to the twilight zone of mythical, but fondly cherished, attempts to restore the original flexibility and pliant toughness of baked-out prints by treatment with water vapor.

Sad to relate, theatre-release prints have sometimes been subjected to more punishment by misguided methods of "rejuvenation" than they would ever receive from actual projection under severe heat conditions. These moisture-restoring treatments have involved everything from a Turkish steam-bath over the snout of a boiling teakettle on the rewind bench to exposure to open tanks of water in the bottom of the film-storage cabinet. The "cure," rest assured, is worse than the "disease." These methods of attempted moisture restoration are almost certain to accomplish nothing but damage to the film.

Although it is true that the expulsion of natural moisture from film base by high-intensity projection tends to make the film brittle and likely to curl, exposure of dry film to moisture can have very harmful results, particularly if the temperature of the film and the moisture-laden air be higher than 55° or 60° F. For example, short-term exposure of film to an excessively humid atmosphere (80% to 100% relative humidity) may fail to

restore moisture to the acetate film base ,but nevertheless damage the emulsion irreparably by excessive absorption of moisture.

Relative Humidity Important

Motion-picture raw stock is "stabilized" at relative humidities of 50%—60% at the factory and sealed in cans with tape to prevent the entrance or escape of air. The raw film is stored before shipment at a temperature of about 50°F., and may safely be opened in laboratory rooms maintained at 70°—80°F. if the cans are first allowed to warm up to the dew-point of the laboratory air to prevent the condensation of moisture and consequent spotting and mottling of the film.

"Relative humidity" is a very important term in film storage and handling. It signifies the ratio of the quantity of water vapor present in the atmosphere to the quantity which would saturate the air at the prevailing temperature. Because warm air can hold more water vapor than cold air, relative humidity is not the same as absolute humidity, a measure of the intrinsic water-vapor content of air.

There is thus more water vapor in the air at a temperature of 80°F. when the air is saturated (100% R.H.) than at 30°F. When warm moist air cools, the excess moisture condenses out as dew, but the relative humidity may remain at the same value.

Emulsion Damaged by Moisture

As stated above, the gelatin emulsion of the film releases and absorbs moisture much more readily than the film base of cellulose triacetate (Fig. 2). The first effect of excessively humid air on film, therefore, is swelling and softening of the photographic emulsion. With prolonged exposure to high relative humidities the emulsion may become sticky and develop glossy spots called "ferrotype mottle." If the film is in a roll, the layers may adhere. Softened emulsion also "sticks" in the heated gate of the projector, and is easily scratched. At comparatively high temperatures moist emulsion frills and reticulates, utterly ruining the film for future use.

Long-term storage of film at high relative humidities may cause the dye images of color prints to fade and the emulsion to become irreparably damaged by mildew or mold, a fungus growth which decomposes the gelatin. Custodians in charge of film vaults are therefore warned against the danger of relative humidities higher than 60%.

Rapid "steaming" of film and short-term storage of the reels over tanks of water both fail dismally to restore moisture to the film base — that is, to restore the normal equilibrium-moisture the film originally had at 50%—60% R.H. when shipped from the factory. It is easy to see why. A single strand of 35-mm acetate film requires about an hour of continuous exposure to moist air to attain normal moisture content from the film-dessicating R.H. of only 20% at 70°F. More startling, 35-mm acetate film wound in a roll requires a *full month* of continuous exposure to moist air for similar conditioning! Few theatres retain prints for so long a period of undisturbed storage.

Damp Air Warps Film

Film is physically deformed by sudden and prolonged exposure to atmospheres of excessively low or high relative humidity. Film which has been warped by improper storage conditions may flutter in and out of focus during projection and give unsteady images on the screen. Warped negatives give difficulties in printing.

If reels of film in equilibrium with the moisture of the air at 50% R.H. are stored at 20% R.H., for example,

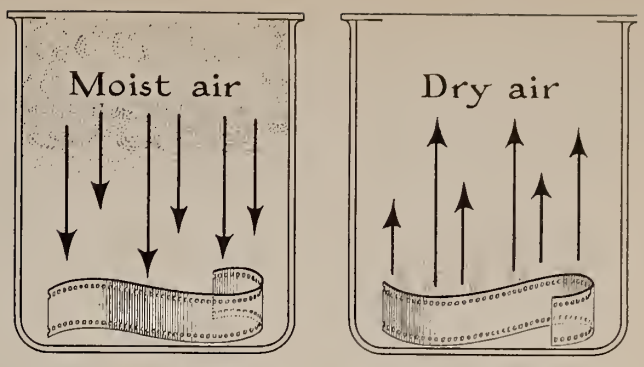


FIG. 1 — The absorption of moisture from excessively humid air by motion-picture film is accompanied by softening and possible deterioration of the gelatin emulsion and shrinkage of the acetate base material. When film loses moisture to excessively dry air, it becomes brittle and curly. The natural moisture content of film is in equilibrium with the water vapor of the air at relative humidities between 50 percent and 60 percent.

the edges lose moisture faster than the interior of the roll, resulting in buckled film. On the other hand, if reels of film at 50% R.H. are stored at 80% R.H., the edges of the roll swell, which may cause fluted or wavy-edge film.

Aside from being an impractical expedient which is harmful to the emulsion and possibly deforming to the base of the film, humidification of film in the projection room usually has other bad effects, even when it succeeds in restoring the normal moisture content of acetate or nitrate base.

The spontaneous chemical decomposition of nitrate film is greatly accelerated by high relative humidities. As a matter of fact, the combination of moist air and high temperatures is very dangerous in the long-term storage of old (and therefore unstable) nitrate prints. Disastrous film fires have occurred in nitrate-film storage vaults where these simple facts were not appreciated and common-sense precautions not taken to retard the spontaneous deterioration of inflammable film.

Even though nitrate film stock has not been manufactured in the United States since 1951, and is no longer used for projection prints, there are uncounted

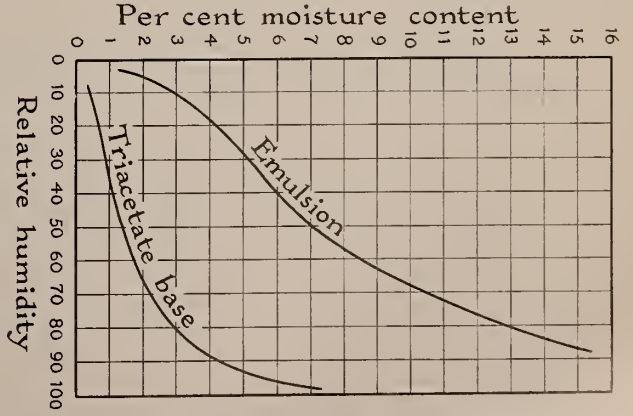


FIG. 2 — The gelatin emulsion of film is much more sensitive to changes in the relative humidity of the air than is the base material, absorbing and losing moisture more readily.

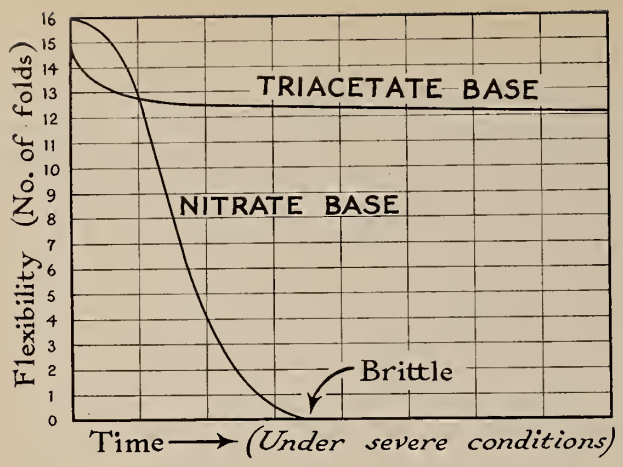


FIG. 3 — The flexibility, toughness, and pliancy of triacetate safety film are practically permanent characteristics of this type of stock, whereas the initially superior characteristics of nitrate film rapidly deteriorate with age and projection use. Barring scratches, torn perforations, and other mechanical damage, acetate prints remain usable long after nitrate prints subjected to similar conditions of use have become brittle, shrunken, and dangerously unstable.

thousands of reels of nitrate negatives and master positives in storage. Although triacetate safety film is almost completely non-inflammable, it resembles nitrate in its sensitivity to abnormal relative humidities.

Just as extremely dry air causes nitrate film to become brittle, so does dry air cause acetate film to become brittle and liable to crack if sharply bent. Dry film also has a tendency to curl, especially if it has been wound too tightly in small rolls or upon small-hub 1000-ft. reels. As a rule, however, dry film loses some of its curliness and regains its tough pliancy when exposed to normally moist air (50%—60% R.H.) for about a month.

Shrinkage Accelerated by Moisture

Also like nitrate stock, acetate film is harmed by excessively high humidities. It doesn't decompose, burn, or explode as nitrate does, but moisture causes it to shrink. Shrunken film is noisy in the projectors and gives weaving, unsteady images on the screen. Many film workers fail to realize that excessive moisture causes film to shrink.

Exhaustive studies made by Eastman Kodak scientists reveal conclusively that the permanent shrinkage of some motion-picture films is approximately twice as rapid at 90% R.H. as it is at 60% R.H.

The initial effect of moisture on film is to cause it to swell. This is observed when the film is immersed for several minutes in developers and other solutions during processing. Now, the initial longitudinal swelling of the film reverses itself and changes to shrinkage during the drying operation. The shrinkage of freshly processed film is usually slight because the processing solutions are cool and because the film is wet for too short a time for the base to absorb much moisture. The subsequent shrinkage is much more severe when the film has been stored for weeks or months in highly humid air and then brought into an atmosphere of normal relative humidity.

High temperatures accelerate all of the adverse changes in film induced by high relative humidities. That is, if the emulsion spoils and the base shrinks at a certain rate at 80°F. and a R.H. of 90%, the deterioration and shrinkage will occur very much faster at 100°F. and the same high R.H. Indeed, motion-picture film is very quickly ruined by the high humidities and temperatures of the tropics, and may even become moldy and sticky in camera magazines and projection-room storage bins.

The ideal storage conditions for motion-picture film, both negative and positive, unexposed and processed, are low temperatures (50°F. or lower) and *normal* relative humidities (not less than 50% or more than 60%).

Do Not Experiment with Prints!

All attempts to restore or introduce moisture to the base material of motion-picture film should be scrupulously avoided by the projectionist. Prints should never be "steamed." Prints should never be stored over open water in the film cabinets. Film should never be kept in cans having glycerine-moistened "humidifying blotters." Do not place camphor blocks or crystals in film cans or storage bins.

There is some evidence that camphor protects nitrate film against undue shrinkage and brittleness; but this writer does not know of any responsible tests anent the effect of camphor vapor on triacetate stock. It is entirely possible that the fumes of evaporating camphor retard the loss of the plasticizers incorporated into the film base during its manufacture, thus preserving the original toughness and pliancy of the film. Camphor was used for this purpose in the old 3-strip Technicolor cameras which exposed three separate panchromatic negatives on nitrate base. Neither 3-strip cameras nor nitrate negative are used today.

If acetate film actually does absorb camphor vapor, there is conceivably a danger inherent in the use of this volatile plasticizer. If the edges of the roll of film take up more camphor than the middle areas, there is a risk of dimensional distortion. Until conclusive tests have made and the use of camphor approved as a film preservative by a responsible film manufacturer, we must refrain from recommending the placement of camphor blocks in film-storage bins.

Our conclusion is a simple one, namely, that the best storage treatment for film in the projection room is a liberal application of common-sense. All cans and boxes containing film, shipping cases, and storage bins and cabinets should be placed in the coolest, driest part of the projection room or rewind room. Film — not even seldom-used "emergency prints" — should be kept in damp cellars or anywhere near hot radiators, arc rheostats, rectifiers, etc.

The relative humidity of the air may be considered satisfactory for film storage when it is comfortable to the projectionists, i.e. neither too humid nor too dry. It is only necessary to keep in mind the simple fact that excessive moisture in the air softens and harms the emulsion of film and accelerates shrinkage of the base material, while excessive dry air makes film curly, brittle, liable to break in the projectors, and retentive of frictional electricity which may produce static crackling and snapping noises in the sound reproduction.

Treatment of prints with water vapor, we repeat, is troublesome, usually ineffective for the intended result, and possibly harmful. The physical condition of theatre-release prints during their exhibition life is much too vital to the welfare of the entire motion-picture industry to be jeopardized by injudicious experimentation and untested treatments. An irreparably ruined print can never be restored. **iP**

Arc Carbon Products Made Separate Group By National Carbon

NEW YORK — The arc carbon products department has been made a separate marketing group by National Carbon Co., Division of Union Carbide Corp. Formerly part of the carbon products organization, the arc carbon products group is headed by J. W. Cosby as marketing manager, who reports directly to W. C. McCosh, director of marketing for National Carbon. Mr. Cosby was previously sales manager for arc carbon products.

Reporting to Mr. Cosby under the new organization plan are: P. H. Freeman, sales manager, and P. D. Ries, manager of engineering services.

Mr. Freeman joined National Carbon in 1950 following graduation from Niagara University. After military service from 1951 to 1953, he returned to the arc carbon sales department, and has had assignments in Atlanta and New York, his most recent position being that of field sales engineer in the New York area.

Mr. Ries attended Case Institute of Technology and joined National Carbon in 1920. He has been associated with the motion picture and graphic arts industries as an arc carbon specialist since 1925. For the past three years he has served as technical consultant. **iP**

RCA Expands Educational Audio Equipment Products

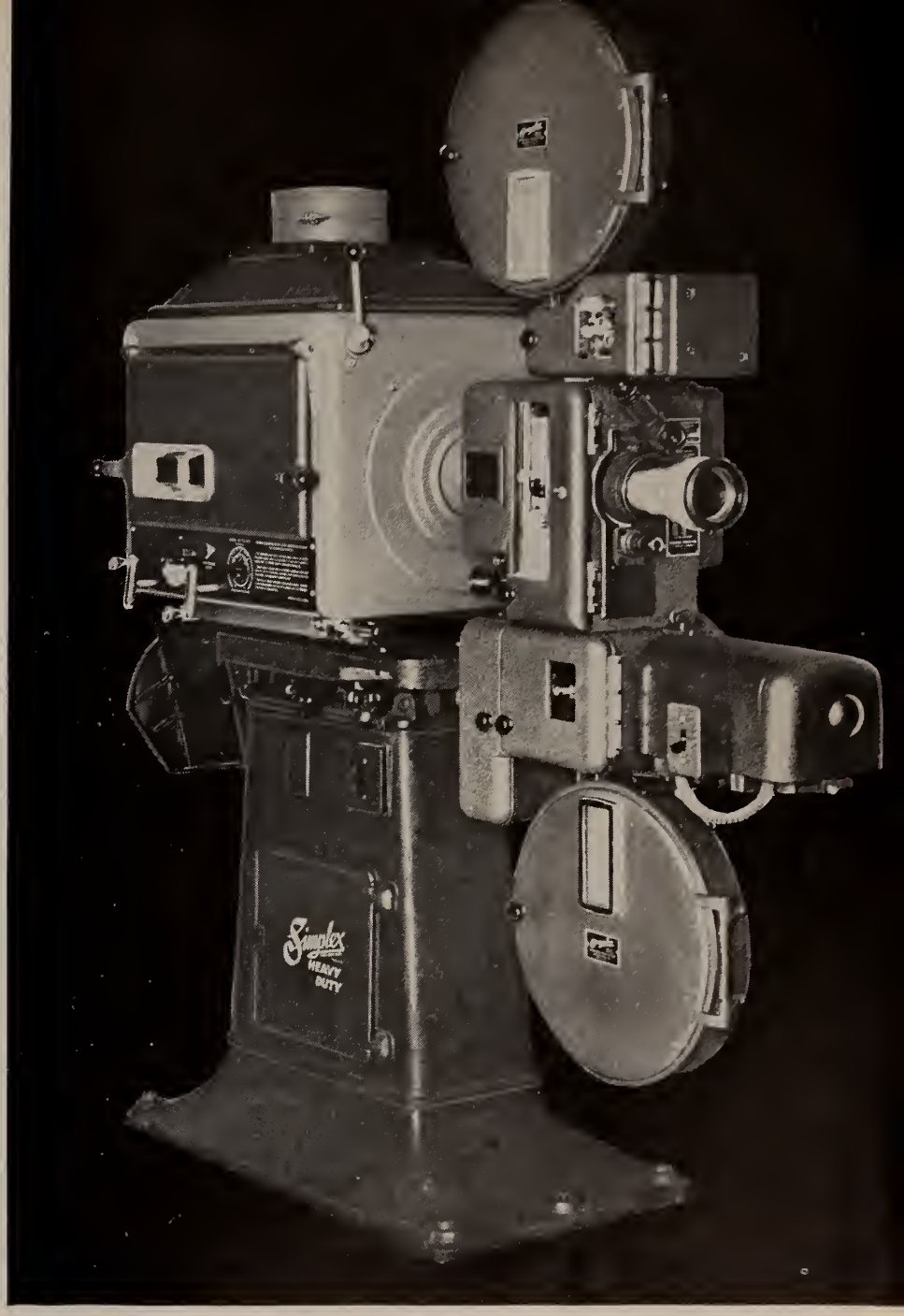
NEW YORK — The Radio Corporation of America has introduced four new record players and a new tape recorder designed for audiences ranging from classroom to auditorium size.

The two record players double as public address systems and may be used for both indoor and outdoor student activities.

The new tape recorder includes a 10-watt high gain amplifier and a matched two-speaker system. It operates at three tape speeds and is driven by three oversized, dynamically-balanced and shielded motors. **iP**

SAM LANGWITH DIES

DENBER — Sam Langwith, one of the founders of the Western Service & Supply Co., here, and operator of the company until late in 1959 when Bob Tankersley took over as manager, died here recently. He is survived by his widow, Olive, 4825 East Kentucky Circle, Denver. **iP**



"Remarkable Reliability"

At New York's famed Radio City Music Hall, chief projectionist Ben Olevsky put it this way. "The reliability of the Simplex X-L projector is remarkable. Our projectors were installed by National Theatre Supply in 1950 and have been maintained by our staff since then. In 11 years of operation they have never been removed for overhaul!" Similar opinions and experiences are reported all the time by projection "pros" like Ben at most top theatres throughout the country. The facts are that no other mechanism on the market is designed and built to the engineering perfection achieved in the X-L. Incorporating every new advance in projection, the X-L is your assurance that you'll have a dependable, up-to-date projector for many years to come.

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Old Nitrate Films Are Dangerous!

By J. M. CALHOUN
Eastman Kodak Co.

Figure 2. A loose pile of a single 1000-foot roll of nitrate motion picture film 15 seconds after ignition. (Wall 9 feet high). From Cobb[9].

Nitrate motion picture film fires and accidents continue to occur with considerable loss of property and sometimes injury to personnel, or even death. These fires occur in spite of the fact that safety film has now been standard in the motion picture industry since about 1951. How does this happen?

It is because many old nitrate motion picture films remain in storage and occasionally others may be imported. Perhaps the greatest danger is that the use of safety film has become so common that people tend to forget about the hazard of nitrate film.

This article has been written to remind all concerned that *old nitrate motion picture films are dangerous!* Every year dangerous fires occur in old nitrate film storage vaults, in trucks transporting film, or in the unsafe disposal of nitrate film no longer wanted. In Table I is a summary of the nitrate motion picture film fires which have occurred in the U. S. and Canada over a period of years, and were reported to the National Fire Protection Assn.

Table I
Nitrate Motion Picture Film Fires Reported*

Years	No. of Fires	No. of Deaths	Property Loss
1931-35	6	15	not reported
1936-40	7	9	not reported
1941-45	1	1	not reported
1946-50	3	0	$1,260,000 (1949)
1951-55	5	0	688,000 (1954)
1956-61	6	1**	350,000 (1958)

*Courtesy, National Fire Protection Assn.
**One 1961 fire added from newspaper report

All such fires are not reported, and the association believes its records account for approximately half of the fires which have occurred. The number of fires with resulting deaths and property loss caused by improper care and handling of nitrate film is convincing evidence of the danger of this material.

EDITOR'S NOTE—Dr. Calhaun is assistant director of the manufacturing experiments department of Kadak Park Works, Rachester, N. Y. Dr. Calhoun received his PhD degree in physical chemistry from McGill University and his work with the Eastmon Kadok Co. has been primarily cancerned with the physicol choracteristics of the film base material af photographic films.

Prior to the widespread use of safety film in theatres, the motion picture industry was geared to the use of nitrate film. During the many years of experience with the hazards of nitrate film, proper safety precautions were established by the National Fire Protection Assn. and endorsed by the National Board of Fire Underwriters,[1] as well as local fire codes. However, it is natural, and even desirable, that these safety precautions should be relaxed where only safety films in use, since the fire hazard of safety film is no greater than that of paper or wood.

Danger enters only where nitrate motion picture film still exisits in storage, or where it is used for printing or projection, or during transportation or where disposal is attempted. It may be handled by people not familiar with the hazards of nitrate to which the industry was accustomed in the past.

There is no way of knowing how much nitrate motion picture film is still in existence. Even though most commercial film exchanges now handle only safety film, many laboratories store old nitrate negatives, and intermediates, generally in vaults, for making new safety prints for television or theater re-release. Ironically, the danger increases as time goes on, because people become more used to safety film on the one hand, while nitrate films become older and even less stable on the other hand.

In addition to regular motion picture industry channels, old nitrate motion picture films are often stored by government agencies, business firms, museums, universities, and private clubs. Very often the people who own or take care of such collections are quite unfamiliar with the dangerous characteristics of nitrate film.

Even private homes sometimes contain old nitrate motion picture films, often stored away in an attic or closet where the temperature is high. This greatly increases the chance of a fire. It may well be that some of the fires which occur every year in private homes from unexplained causes are actually due to spontaneous ignition of small collections of old nitrate films.

Any valuable nitrate motion picture films should be turned over to a museum or agency which is equipped to store them safely, or else they should be copied on safety film and disposal arranged for the originals. If

they are not valuable they should be disposed of promptly by the means suggested at the end of this article.

Fire Hazard

The fire hazard of nitrate film has often been described.[2 3 4 5] Everyone should remember that nitrate film is a close cousin to gun cotton which is used in high explosives. Nitrate film:

1. Ignites easily, often spontaneously.
2. Burns rapidly and violently, even without air.
3. Causes explosions under some conditions.
4. Produces large amounts of very poisonous gases.
5. Is very difficult to extinguish once ignited.

Nitrate film can be ignited by contact with a hot light bulb or radiator. Spontaneous combustion can result from storage in warm weather, particularly under an uninsulated roof. Nitrate film also decomposes spontaneously with age, especially under warm, damp conditions.[6, 7] Deteriorated nitrate film is more likely to ignite spontaneously than good film. Deterioration can be detected by the characteristic odor of nitric acid, yellow discoloration, sticking, brittleness, and in advanced stages, the formation of a hard "froth" or brown powder on the film. (Figure 1).

Once ignited, nitrate film burns with tremendous speed and violence. A single roll of film becomes a large flaming mass in a few seconds (Figure 2). A small storage room full of nitrate film, if ignited and not protected with automatic water sprinklers, can shoot a massive flame 20 feet high for a distance of over 100 feet (Figure 3). The magnitude of the fire depends only on the quantity of film involved. Nitrate film will burn even in the absence of air, because it already contains sufficient oxygen internally. Such a fire cannot be extinguished by smothering, but only by an immediate deluge of large quantities of water; hence the importance of automatic water sprinklers in nitrate film areas.

If nitrate film becomes ignited in a confined space not provided with a vent, the gases formed often explode with great violence. Vault doors can be blown off and roof or walls blown out. A roll of nitrate motion picture film thrown in an incinerator can blow off the door. Even though nitrate film does not detonate on impact, it should be treated with the same respect as explosives.

Finally, burning nitrate film gives off large quantities of thick yellow nitrogen oxide gases (Figure 4), particularly where the air supply is restricted. These gases are approximately ten times as poisonous as carbon monoxide [6] and have frequently been the cause of deaths.

Film Identification

The first precaution in preventing accidents with nitrate motion picture film is to clearly identify it and separate it from the more common safety film. Identification is not always as easy as it might seem. Although most processed motion picture films carry the words SAFETY or NITRATE printed along the edge of the film, there are exceptions. It is also possible for the word SAFETY to have been printed from a safety master positive or duplicate negative onto a nitrate print. The only safe rule to follow is:

Unless the film is clearly identified as safety film beyond question, assume that it is nitrate until proven otherwise.

Another important point to remember is that a roll of

Please turn to page 17



Figure 1. Nitrate motion picture film in various stages of decomposition.

A. Image faded out and emulsion sticky.



B. Hard "froth" on side of roll.



C. Partially decomposed to brown powder.

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Yes, films are among our most potent ambassadors of understanding and good will. That's why the investment in film-making of time, talent and fine materials is so important; why the Eastman Technical Service for Motion Picture Film is constantly on the alert to help solve questions of production, processing and projection. Branches at strategic centers. *For information, write:*

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New Interest In Projection Sparks SMPTE Convention

Although advances in color motion pictures, and color TB, were the main theme of the recent convention in Los Angeles of the Society of Motion Picture and Television Engineers, a substantial portion of the program was devoted to new products and techniques in standard theatre motion pictures.

Delegates heard more than 70 research reports as a new Los Angeles convention attendance record of 1,150 was set with 2,000 more viewing an exhibit of new movie and TV equipment from 50 companies.

SMPTE president John W. Servies, vice president of National Theatre Supply Co., a subsidiary of General Precision Equipment Co., set the pace in heralding the importance of research. He pointed out the subject matter of papers given at conventions had changed with the advent of television and high-speed photography as the Society members entered these new fields. "However, the number of papers on motion pictures in a year's issue of the Journal has remained about constant," said Servies. "The percentage of such papers has, of course, greatly decreased.

"However, for individuals, in any particular field, to produce and deliver papers on new developments, they must be encouraged along those lines by their superiors in company management.

"The real reason for fewer papers on motion picture subjects lies in curtailed research and development and unconcern of management in technological progress."

Saying production is doing little to originate new methods and also not using tools already developed, Servies called on Hollywood to produce more color pictures, to give the public the stereophonic sound it has demonstrated it wants, and re-emphasize research by supporting and augmenting its engineering staff in a quest for new and better tools

Max Youngstein, executive vice president of Cinerama, Inc., followed up with a call to the motion picture industry to utilize its manpower and brainpower and to recognize research is as essential for motion picture and television as it is for the petroleum and steel industries.

Deploring the two industries' reluctance to move forward through research except when faced with a crisis, Youngstein urged the combining of "story content", the most important element of entertainment, with research to achieve superior quality.

At the Projection Practices session at the Acadwemy Award Theatre, Don V. Kloepfel of General Film Laboratories told how plastic film shoes had been developed in place of steel shoes to eliminate sticking and tension in laboratory projection; Walter Beyer of Universal Pictures outlined recent developments in cinematography; Henry Goldfarb of De Luxe labs reported the method by which 20th Century-Fox transfers a CinemaScope negative to standard television presentation.

Climax of the session was the demonstrating of the liquid gate projection of motion picture film by J. R. Turner, P. A. Ripson, F. J. Kolb, Jr., and E. A. Yavitz of Eastman Kodak

The projection of freshly processed motion picture film was discussed by Mr. Kloepfel, who said,

"During the first few projections of freshly processed motion picture film difficulty is often experienced because the film tends to stick to the hot metal parts of the projector gate. To prevent this sticking, film is always lubricated with some solution so that it will pass through the projector without trouble. Because of inherent film properties, lubrication does not always prevent sticking.

"One solution to the problem is to substitute some material other than steel for film shoes. Plush strips, felt pads, hardwood film shoes, or bamboo impregnated with oil or silicones have been used. This paper describes the use of Delrin, a comparatively new acital resin, as a substitute for steel film shoes. Film does not stick to this surface and consequently, the picture on the screen is steady, there is no chatter and no
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HONORED—Supervisor board chairman Ernest Debs presents a citation to John W. Servies, president of the Society of Motion Picture and Television Engineers, and vice president of National Theatre Supply Co., commending the society's members for "their high ideals and technical skills." The award was made at opening luncheon of the society's 91st convention at the Ambassador Hotel in Los Angeles.

strain on the perforations of the film."

While each of the papers and sessions featured significant contributions to motion picture and television techniques, particular interest was focused on:

The many papers centering on color including description of Eastman's new color negative to improve picture quality and a higher speed color print film, both given by W. I. Kisner of Eastman Kodak; methods of eliminating dye fading in negatives and resultant increased cost in print reorders, a tutorial session on principles of color by Ralph M. Evans and P. W. Vittum of Eastman; and many papers covering improved lighting either in production or processing.

Airing of the problems and uncertainties that are holding up expansion of the 8 mm. sound on film production and printing.

Walter L Wallin of Wallin Optical Systems described a method of increasing the amount and uniformity of illumination to achieve greater screen brightness; and Harold H. Schroeder, Bausch & Lomb who spoke on "Multifilms in the Theatre and Television." **iP**

Xenon Lamp and Carbon Arc Compared

LOS ANGELES, CALIF.—A side-by-side comparison of the Xenon projection lamp and a carbon arc was afforded a large number of representatives of various motion picture and television studios, film processing laboratories, theatres and supply dealers at the General Film Laboratories, Hollywood, during the SMPTE Convention.

The Strong X-16 Xenon lamp and the carbon arc burning at 45 amperes were both adjusted for 18 foot lamberts center of screen, and identical film clips were projected.

During a question and answer period it was pointed out by Arthur Hatch, president of Strong Electric Corp., that "push button repeatability" of intensity and color temperature was obtained with the 1600 watt Xenon arc on screens up to 28 ft. wide.

Field Tested

Utilizing tungsten electrodes in a Xenon atmosphere, totally enclosed in a quartz bulb, the Xenon light source has been field tested for an extended period of time. The Xenon lamp will produce 9000 lumens through a 35 mm old standard aperture and 11,000 lumens through a CinemaScope aperture without shutter running.

Advantages of the new light source include a steady, flickerless, pure white light with no discoloration at the screen and extremely even distribution of light throughout the total screen area. The spectral composition of the light makes it possible to show color films brilliantly and with excellent color reproduction.

The color of the light is independent of voltage variations of the power line supply. A minimum of heat is projected to the aperture plate and film by this light source. Finger burning on the aperture is a thing of the past with the X-16 projection lamp and the film runs so cool as to stay in perfect focus, there being no buckling due to projected heat.

Simpler Operation Claimed

Xenon arc bulbs make for greater simplification of operation for the projectionist, easier maintenance and cleaner equipment, which should assure maximum life for the projector. The once-adjusted focus of the bulb stays constant. No moving parts are employed in the light source and no special cooling is required.

The 1600-watt Xenon bulb has a life expectancy of 1500 hours average and the cost of bulb replacements, together with that of electric current, is a little more per hour than the cost of current and carbons for operating the high intensity carbon arc 46 ampere projection lamp, the company states. **iP**

The finest carbons ever made...

NATIONAL TRADE-MARK

PROJECTOR CARBONS

Advertisement

New Tools to Work With:

A New Carbon Saver for Rotating Carbons

NO TOOLS REQUIRED—NO DRILLING

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9-10-11mm $3 each
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New magnetic reel cabinet numbers; strong magnet holds number to cabinet. Easy to see and quick to change.

Set consists of No. 1 to No. 8 plus 4 blanks with wax pencil. Red or black, $3.50 per set. No CODs; send check.

LOU WALTERS
Projector Repair Service
8140 Hunnicut Rd., Dallas 28, Texas

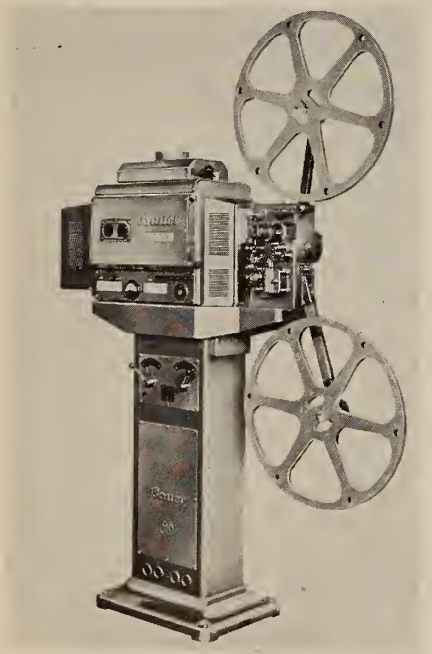
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CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES
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iP AUDIO-VISUAL

Bauer 16mm Pedestal Projector with Xenon Lamp Now Available

LONG ISLAND CITY—Intercontinental Marketing Corp. has announced that the Bauer 16mm sound projector with Xenon lamp is available in this country for permanent installation in projection rooms or an auditorium equipped with a white matt screen up to 16 ft. wide, normal aspect, or 21 ft. wide CinemaScope.

Called the Bauer Selection, which is manufactured by the Eugen Bauer company of Stuttgart. Germany, the pedestal type projector measures to



a height of 6′ 2¼″, the length is 4′ 6¼″, with a width of 1′ 3¼″. The weight is approximately 264 lbs.

The movement is a maltese cross with automatic circulatory lubrication. It features push button control and accepts reels up to 5,000 feet. Lenses from 1″ to 3″ fl. 5 to fl. 6 are available.

Magnetic or optical track heads are installed and can be set at the turn of a switch.

Light output of the Xenon lamp is 2,300 lumens. The Xenon lamp is instant starting and requires no maintenance or adjustment throughout the life of the bulb, which is said to have a minimum life of 1,500 hours.

According to IMC, the Bauer Selection projectors have been in use in schools, TV stations, advertising agencies in Europe, and 18 have been in constant use in Disneyland since its opening.

Intercontinental Marketing Corp. is the importer of Bauer 8 and 16 mm motion picture equipment. **iP**

New 16mm Bolex Catalog

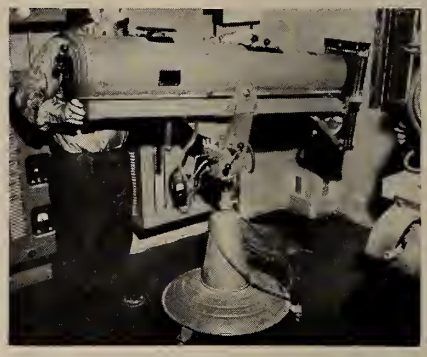
New York — Paillard Inc., U.S. distributor of the Swiss-made Bolex motion picture equipment, has issued a new catalog describing Bolex 16mm cameras, projectors and accessories.

The catalog details the H-16 Rex camera; the Bolex S-211 and S-221 sound projectors; tripod; Unimotor; Rexofader and underwater camera housing. A chart shows the complete line of lenses for Bolex 16mm cameras. **iP**

BESELER NAMES ADMASTER

EAST ORANGE, N. J. — Admaster Sales Corp., New York has been appointed a franchised dealer for the Beseler Projection Division of the Charles Beseler Co.

Admaster will service the metropolitan New York area and will handle sales of Beseler VuLyte opaque projectors, plus all accessories and supplies. In addition to the sale and service of equipment, Admaster, with headquarters at 425 Park Ave. So., New York City, through its subsidiary Admaster Prints, is offering a complete visual aids service to assist clients in the preparation of projection materials. **iP**



MODERN LIGHTING — Dale Danielson, owner of the Dream Theatre, Russell, Kansas, is shown here with the Strong Trouper Arc Follow Spotlight installed for modern lighting of live attractions playing this theatre.

New Hot Splicer From Florman & Babb

NEW YORK — Florman & Babb, Inc. announces the availability of the Acmade foot-operated hot splicer.

This splicer is constructed of the finest materials and workmenship. All castings are of the best quality and the top body and cutter arms are seasoned to prevent distortion. The cutter blades are made from stainless steel with tungsten carbide inserts, which have indefinite life and will not require sharpening as with other types.

A heater unit is installed in the top body of the machine. The top light in a well glass fitting is attached to the body of the machine and also an inspection light in the waste bin together with cement bottle and brush. A scraper block is supplied and also a scraper block setting-jib and support shelf, which is rubber-covered. The combined 16mm/35mm Model is priced at $1495. **iP**

• BRIGHTER LIGHT
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• SHARPER PICTURE
Free Test Samples

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CARBONS INC., BOONTON, N. J.

• STEADIER LIGHT
• LESS ATTENTION
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Free Carbon Chart

Texas Drive-In Screen Light Penetrates Mexico Territory

BROWNSVILLE, TEXAS — The Fiesta Drive-in, South of Brownsville, the most Southern border drive-in in the United States, has its screen practically on the Mexican border, with its spillover projected light reaching into Mexican territory.

M. M. Roden, city manager of Lone Star Drive-in Theatres, which operates the Fiesta, said the new light is now so intense and brilliant that it's easier for the drive-in's border patrol to apprehend the "muchachos" who slip across the border to enter the Fiesta without paying the necessary pesos, which the theatre will accept in lieu of American currency.

William Spooner, Lorraine Arc Carbon projection engineer for the area, after alignment corrections by he and the Fiesta projectionist, said the light measured at 8.2 foot lamberts, almost 5 foot lamberts more than the average foot lambert readings of drive-ins as noted by the Research Council in a report a few years ago. The incident light readings, Spooner said, now measure 10 foot candles, and prior to the visit of the Lorraine booth service engineer, this theatre read only 1 foot lambert on No. 1 machine and 1.4 foot lamberts on No. 2 machine.

The Fiesta screen in 52 ft. by 36 ft. with a throw of 480 ft. The light source in the booth is by Strong Mogul arc lamps with 14 inch mirrors, 7 inch F 2.0 B.L. lenses, a generator 80 - 160A - 60V, Lorraine Super 8 x 14 Grade 544-10C positive and 7 x 9 Grade 545 negative carbons, at 75 amps. 48 volts. **iP**



City manager M. M. Roden of Lone Star Drive-in Theatres points out to William Spooner, Lorraine Arc Carbon projection engineer, the booth of the Fiesta Drive-in. The screen in the background is practically on the Mexican border.

KODAK EXHIBIT

ROCHESTER, N. Y. — Eastman Kodak Co., for an exhibit in the New York World's Fair 1964-65, has leased an area of more than 75,000 sq. ft. in the industrial area at the intersection of the Fair's main avenues. Will Burton of New York and Saul Bass of Hollywood did the design work for the elaborate Kodak exhibit. **iP**

NEW BRANCH OFFICE

SAN FRANCISCO — The Gevaert Company of America, Inc., announces the opening of a new branch office at 1485 Bayshore Boulevard here, telephone number DElaware 3-7569. Kent Rooks is Gevaert northwest district manager. **iP**



25-YEAR CLUB — Dick Lutz, assistant branch manager, Denver office, joins National Theatre Supply Co.'s 25-year club. Presentation of the NTS 25-year watch was made during the western district sales meeting held at the Pen and Quill Motel, Manhattan Beach, Calif. Pictured above is Lutz being congratulated by NTS president Bill Turnbull. Looking on are Joe Stone, left, Denver branch manager and Lloyd Ownbey, right, vice president and western district manager.

Movie Makers Should Follow Through On Theatre's Audio Visual Quality, Producer Says

Robert Wise, producer-director of "West Side Story," winner of 10 Academy Awards, which in addition to Best Picture included Best Cinematography for Color, and Best Sound, firmly believes that reproduction of sight and sound in motion picture theatres should be of the same high quality as when they are filmed and recorded.

While in London for the recent Royal Film Performance of "West Side Story," at the Odeon Leicester Square, Wise personally checked out the projection and sound at the Odeon as well as the Astoria, where the 70mm, multi-sound channel Technicolor picture was playing. Both theatres passed a close inspection by Wise.

Wise holds that those responsible for the creation of motion pictures should follow through to the final theatrical presentation to the public. He admits, however, that often this is impossible.

At a time when the public is more aware than ever of audio-visual quality, Wise's quiet campaign for authentic reproduction appears to be one worth emulating by other filmmakers, industry observers agree. **iP**

Depressed Area Brings Trouble for Projectionist Solidarity

DULUTH, MINN. — This northern metropolitan area, plagued by local business failures, steel and mining companies driven out by high taxes, now has another even more serious problem — the dilemma of motion picture companies, faced with reduced patronage, cutting projectionists. Local labor leaders see the move as a threat by Minnesota Amusement Co., major midwest chain, to reduce or break the IATSE locally. Members of IA contributed to the breakdown of cooperation.

The theatre chain, after several months of picketing by Local 509 and other organizations, entered into individual contracts with two operators at the Norshor Theatre rather than settle the dispute with Local 509 through collective bargaining, local officials charged.

At issue has been a company decision to cut the theater's hours from 84 to 70 hours of operation a week. Local 509 had set a policy that any reduction in theater hours should be divided equally among the operators, according to Business Representative Hal Olson.

Kitzman, Poulin, and Daneiko had been working 28 hours a week each for a total of 84 before the dispute began. Dividing a 70-hour week equally would have cut each man to 23 and a third hours a week.

The Norshor development is believed to be the first instance of its kind in the 75-year history of the international union. And Local 509 has had a union shop at the Norshor or its predecessor theaters in the same location since World War I days.

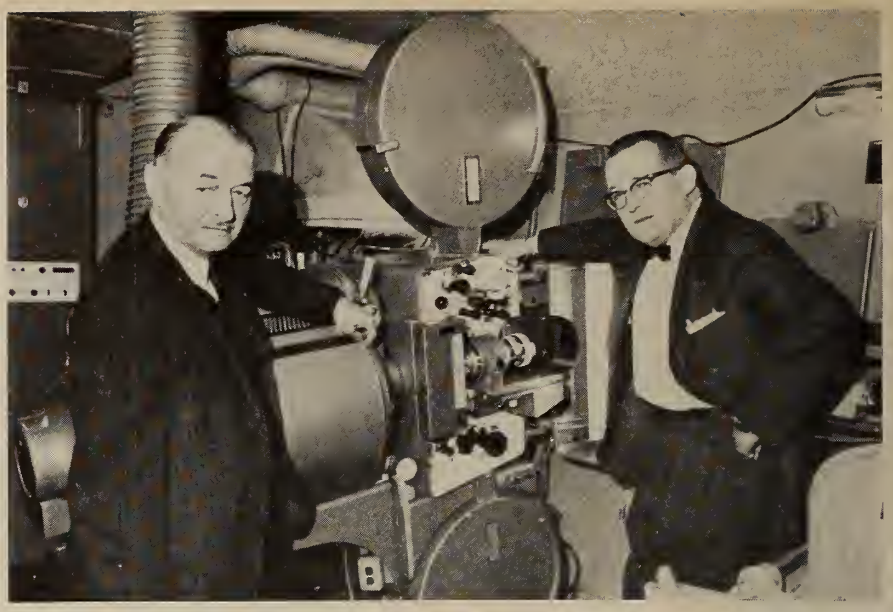
The company convinced two Local 509 members, Chester Kitzman and Frank Poulin, to go back to work across the union's picket line under individual contracts rather than a union contract. The Norshor's third striking operator, Frank Daneiko, has not returned nor has the Norshor's stagehand, Herman Fostoff.

The theater's announcement that Kitzman and Poulin were returning to work under individual contracts said they'd split the 70-hour week or 35 each with a 10.5c hourly increase in wages now plus another 5.5c an hour next April. That means the two, in by-passing their union, were assured seven hours more work a week than they had been getting plus a 16 hourly pay boost over two years.

Danieko, the third man, was eliminated by this arrangement although the daily press quoted Kitzman and Poulin as saying they're trying to assign him part of the 70-hour week. Daneiko, however, would be left with only 14 hours of work a week even if Kitzman and Poulin stayed at their old 28-hour week rather than split the reduction equally.

Olson said Local 509 is considering what steps should be taken against Kitzman and Poulin as union members.

The company's action amounts to an attempt at "open shop" operation setting a precedent for not only Minnesota but the entire nation, according to Olson. If it is successful, it may be tried elsewhere. **iP**



FLOATING CINEMA — Fred J. Pfeiff, left, technical manager of Norelco Motion Picture division of North American Philips Co., Inc. and Niels Tuxen, general manager, communication and electronics division, inspect Philips' motion picture installations aboard luxury liner SS France on the ship's first visit to New York. Shown is one of two Norelco 70/35 mm projectors. A complete story on the installation will appear in next month's IP.

IATSE Issues Checklist Of U.S.-Made Films

NEW YORK — As a means of encouraging more and more home production of motion pictures, as outlined in last month's IP, the IATSE has urged "attending and boosting films produced in Hollywood and elsewhere in the U.S. and Canada."

The IA has issued a checklist of such pictures, now in release or set for release, urging members to patronize and promote the pictures. **iP**

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Projectionists Square Club Pays Tribute To Jack Winick

NEW YORK — The Projectionists' Square Club honored Jack Winick in its March meeting, presenting him with a lifetime membership Gold Card. The Masonic organization for projectionists, cited Winick for his devotion to the Club and to the Masons.



WINICK

He is past president of the Club, also past president of the Theatrical Square Club, past president of the National Masonic Clubs, and past president of the 25-30 Club.

Julius Halpern, in his president's message for the bulletin for the meeting, paid glowing tribute to Winick and cited Jack's many activities to the club and other fraternal and civic organizations. **iP**

W. C. KUNZMANN DIES

CLEVELAND—William C. Kunzmann, 77, a charter member of the Society of Motion Picture and Television Engineers, died here last month.

A motion picture projectionist and theatre owner in Ohio in the industry's Nickelodian days, Mr. Kunzmann joined National Carbon Co., division of Union Carbide Corp., in Cleveland in 1907 and was associated with the company's projector carbon business for nearly 50 years. He had retired in July, 1952 and was retained as a consultant until January, 1956.

Mr. Kunzmann was active in the formation of the Society of Motion Picture and Television Engineers in 1916, and served as convention vice president of the organization from 1934 until 1952. **iP**

IATSE Plans Bond With Hemisphere

NEW YORK — The IATSE has joined a movement to establish a common bond among workers in the entertainment world throughout the Western Hemisphere.

The action is aimed at "the lessening of unfair competition through improvement of sub-standard wages and protection of reissue rights," according to IATSE president Richard F. Walsh.

The IA board placed itself on record at the meeting as approving the affiliation of the IATSE with the new-born Inter-American Federation of Entertainment Workers, the organization of which was expected to be completed at a meeting of its founding congress in Lima.

Walsh was said to have "noted, too, that the Inter-American Federation was regarded as a first step toward global federation, also that it was important for all unions in North America to join, so as to offset the influence of certain Communist-dominated unions in the Latin American countries." **iP**

Nitrate Dangers

from page 9



Figure 3. Violent discharge of flames, film cans, and film from vault with horizontal vent. Nitrate motion picture film 4,970 lb., without water sprinklers. Photograph, courtesy of Inter-Agency Advisory Committee on Nitrate Film Vault Tests and the National Bureau of Standards. From Ryan, Cummings and Hutton[10].



Figure 4. Discharge of very dense fumes from vault with horizontal vent. Nitrate film 3,585 lbs., with water sprinklers. Photograph, courtesy of Inter-Agency Advisory Committee on Nitrate Film Vault Tests and the National Bureau of Standards. From Ryan, Cummings and Hutton[10].

film is frequently made up from several lengths spliced together. Sometimes nitrate and safety films are mixed in the same roll. In such cases, identifying the outer lap of film is not sufficient.

A number of dependable methods have been described for identifying Eastman motion picture films,[6] but some of these are not applicable to films of other manufacture.

All Eastman safety motion picture film contains a chemical in the base which fluoresces when the film is viewed on edge under an ultraviolet lamp. This method of identification has the advantage that if different kinds of film are spliced together in the same roll, this is immediately visible. Film which does not fluoresce under ultraviolet light may or may not be nitrate.

The best test for nitrate film is the burning test, which can be made safely if certain precautions are taken. *The burning test must never be made on film in a roll or even on a long piece of film.* A small sample should be cut from the roll and taken into another room where no film or other hazardous material is present. If a long

please turn page

piece of film is ignited and it turns out to be nitrate a serious burn or a bad fire may result.

The burning test must be made in a carefully prescribed manner or an inexperienced person may still confuse nitrate and safety film, particularly since only a small sample can be burned safely. For example, Duplitized nitrate motion picture film with emulsion on both sides does not always burn as fiercely as one expects, and sometimes small pieces of safety film held in a match flame burn more rapidly than expected. Following is a burning test given in American Standard PH1.25-1956[8] which can be conducted readily.

> "SAMPLE. *Cut a piece of film approximately 16mm (0.63 in.) wide and 35mm (1.38 in.) long. Bend the film lengthwise and crease it sufficiently so that when released it will stand upright.*
>
> "PROCEDURE. *Stand the film sample (with the crease vertical) on a flat surface such as an ash tray, glass plate, concrete floor, etc. This should be done at a safe distance from all film stocks. With a match flame, ignite one of the top corners of the film. Anyone unfamiliar with the burning of safety and nitrate photographic films should first conduct this test on samples of both types of film, the identities of which are known.*
>
> "INTERPRETATION. *If the film ignites easily, burns downward rapidly and vigorously with a bright yellow flame, and is completely consumed in less than 15 seconds, it probably contains dangerous quantities of cellulose nitrate and probably will not pass the standard tests for safety film. If the film sample ignites with difficuty and burns only partially, or if it burns completely in a time not under 15 seconds, compliance with the standard tests may be considered assured and the film classified as safety film. If the results of the field tests are doubtful, the laboratory tests specified in this standard should be conducted.*"

Storage and Handling of Nitrate Motion Picture Film

The safe storage and handling of nitrate motion picture film is specified in detail by NBFU Pamphlet No. 40, ([1]) which everyone concerned should carefully follow. These standards were developed by the National Fire Protection Assn. together with various other organizations over the years, and were revised again in 1953. They are also issued by the National Board of Fire Underwriters and are commonly known as "Underwriters' regulations."

It is impossible in a short article to list all of the Underwriters' regulations, but a few will be mentioned. All nitrate film must be stored in a fire-proof vault constructed according to specifications and containing an explosion vent and automatic water sprinklers. The quantity of nitrate film in any one vault or working area is restricted. Unprotected steam pipes, light bulbs or other sources of heat are not permitted. Small quantities of nitrate film may be stored in special vented cabinets which meet Underwriters' specifications. Special precautions are also required in areas used for printing, handling, or projecting nitrate film. *Above all, smoking must not be allowed in any room containing nitrate film.*

Nitrate motion picture film storage vaults should be kept cool (below 70F.) and dry (below 60% relative humidity). Films should be inspected once every year and any showing signs of decomposition should be copied on safety film and then discarded. Where a vault contains a large film collection, random inspection of every tenth roll should be adequate. Film in vaults which are not kept cool and dry should be inspected more frequently.

Disposal of Nitrate Film

The disposal of nitrate motion picture film requires a special word of warning. Film which shows any signs of decomposition should be immersed immediately in water in a metal drum or tank. Whether decomposing or not, nitrate film must not be mixed with scrap safety film or other forms of rubbish. It must not be put into an incinerator because of the danger of explosion.

Ultimate disposal of nitrate film should be carried out only by experts using methods approved by the local fire department or other authorities. Two methods may be mentioned:

1. BURNING — This can be done safely only out of doors in a large area away from any buildings. The film should be burned in batches of not over 25 lbs. and personnel must take proper precautions to prevent injury from the toxic fumes produced.
2. AT SEA — Areas located on the coast, such as New York and Los Angles, might arrange to have scrap nitrate film hauled out to sea at an approved location and dumped overboard.

REMEMBER! To prevent dangerous fires with nitrate motion picture film —

1. Identify and segregate all nitrate film.
2. Store only in Underwriters' approved cabinets or vaults equipped with an explosion vent and automatic water sprinklers.
3. Keep film cool and dry.
4. Inspect once a year or oftener.
5. Immerse in water any film showing signs of decomposition.
6. Follow National Fire Protection Assn. (Underwriter') regulations for handling film in printing, projection, etc.
7. Dispose of all nitrate film only by approved procedures.
8. If nitrate film does ignite, evacuate personnel instantly and warn firemen of the danger of explosion and poison gases. **iP**

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Volume 37 June, 1962 No. 6

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

OBVIOUS REASONS FOR SLUMPS

Although theatre advertising has taken an even steeper dive in the past several years than have theatres and the motion picture business themselves, what advertising the theatres do get is about the most negative thing one can imagine.

How many times have the projectionists complained about the quality of the commercial shorts they are supplied? Nothing is done. The advertiser comes into the theatre, complains bitterly about the quality of the short, as well he should, and what happens? The exhibitor says it is all the fault of the local theatre ad supplier, and if the complaint continues, he says, he will really have it out with the ad supplier and his projectionist, who after all "is responsible for the correct presentation of your ad and we will see that it is done."

So here you are, being maligned without knowing it — and without having a darn thing to say about the quality of the film in the first place. Maybe it's time to speak up and complain about the miserable quality of commercial shorts being foisted on the average exhibitor. Some of the trailers of this type coming into your theatre are actually unfit for showing where pride is taken in a good job. Open, close and date strips are of poor quality, carelessly made and obviously the product of innumerable reprintings.

(It wasn't so long ago that the only thing that would get the short supplier to change his set and shoot new strips was the girl's hairdo and skirt length. Maybe we owe some sort of a debt to the fashion experts for changing these two items every six months, or our smaller theatres would still be sending some doll in a Clara Bow haircut waltzing down to the store with her milk bucket in her hand.)

These worn, inaccurate strips jump and rock on the screen, are fuzzy in image definition, contain black or incomplete frames and more often than not are supplied without long enough date strips to do a good job of splicing.

What stake has the projectionist in this — it isn't his theatre? If he is getting even part of the blame, whether he has been told about it or not, he owes it to himself to upgrade the projection of theatre advertising. Often the exhibitor will not realize how really bad these commercial messages are unless he has had an advertiser complain, or unless you tell him.

The exhibitor should buy his stuff from a reputable house, who can supply excellent quality by mail within hours. Each major center has film advertising experts available, and there is no longer any excuse for making up amateurish titles and cartoon sequences in some local shop. Helping him with advice on the quality he is presently getting might sell more advertising, draw more results for local merchants and keep your theatre open longer.

Frank Cooley

INTERNATIONAL PROJECTIONIST

Volume 37 June, 1962 Number 6

Design Features of 35-mm Projectors

By ROBERT A. MITCHELL

THE GREAT MAJORITY of available professional motion-picture projectors embody a quality of materials and workmanship unsurpassed by other products of the machinist's art. In addition, the design of both picture and sound "heads" generally meets approved mechanical principles and makes adequate allowance for ease of operation, maintenance, and the replacement of worn or damaged parts. All good brands of projector mechanisms and sound reproducers are obviously built to give many years of service with a minimum of upkeep.

Are all these praiseworthy characteristics of successful motion-picture machine manufacture a benefit to the projection craft and to the exhibition industry as a whole? At first thought it might appear absurd to suggest that theatre projectors are "too well built," yet, in a sense, such may actually be the case. There is little commercial incentive to improve and modernize equipment built to last "forever," particularly when the market for such equipment is so limited (in comparison with the market for automobiles or washing machines) that its purchase price is necessarily high.

Projectors Become Obsolescent

The very best projectors and sound equipments are indeed costly to buy, although economical to the purchaser because they do not wear out for years and years. But in one important respect, the purchaser of durable projection equipment gets the short end of the bargain. Machinery as durable as a high-quality motion-picture projector is absolutely "frozen" in regard to most of its specific features. That is to say, its mechanical design and physical structure become obsolescent — downright old-fashioned — even while it remains in perfect working order, grinding out movie entertainment for many decades.

Many of the projector mechanisms now in use were originally purchased in the gilded age of silent movies, and have spanned an era of cinema history from Fatty Arbuckle to Jack Lemmon without missing a single performance. These old rattletraps were mounted on ERPI soundheads and universal bases in 1929, antique heaps of junk which are still reproducing movie sound. A hilarious touch was furnished to these archaic contraptions by the addition of CinemaScope lenses and magnetic reproducers in 1953.

Of course, the "built-in obsolescence" which practically guarantees that a cheap vacuum cleaner or TV set will break down in five or six years has no place in the field of commercial and industrial equipment. The possession and use of theatre equipment is a serious business, not a "consumer luxury." But it remains a fact that technology has marched forward while the projection and sound equipment in most theatres whirs away unchallenged in archaic glory. Disregarding the 70-mm field, a brand-new model of straight 35-mm projector has not been produced in America for more than a decade!

Only the very latest American mechanisms (more than ten years old) are designed to accommodate the more recent technical advances for improved screen results under present-day conditions of wide screens and high illumination levels. The Simplex X-L, for example, may be brought up-to-date with curved gates, water and air cooling, high-speed intermittent movements, narrow-blade shutters, and even "liquid gates" which enclose the projected film in a bath of methyl chloroform for the reduction of buckling and focus drift and the elimination of scratches from the projected pictures.

Older projectors can be "modernized" only partially and with uncertain results. The addition of sound or CinemaScope to silent mechanisms, for example, or the refurbishing of old front-shutter machines with rear shutters (of a type, by the way, which have themselves gone out of date). Even though these old-fashioned machines gave very good results in the days of small screens and low light levels, the addition of short-focus and CinemaScope lenses to them only serves to magnify their mechanical and optical shortcomings.

Speaking of old-time projectors, the Powers cannot take short-focus lenses at all, and the Simplex Regular requires special short-focus lenses manufactured by Kollmorgen for good results. Thanks to the Kollmorgen Xtended series of lenses, severe image vignetting has been avoided in many theatres where mechanisms having small-diameter lens mounts are still in use.

The annoyance of side-weave and film buckling must always remain an unsolved problem to users of the older projectors for which curved gates or improved film edge-guides are not available; and the continued use of small 16-tooth feed and holdback sprockets (much less gentle to the film perforations than the larger 24- and 32-tooth sprockets) cannot be avoided. It is also a tedious chore to change intermittent sprockets or to replace shutter gears in most of the old-time mechanisms. Projectionists operating on old-fashioned junk equipment sure do earn their money! And those exhibitors who persist in re-

taining junk projectors and sound equipment are lucky to be earning a dime.

A Need for Simplification

We view with admiration all the modern improvements and heavy-duty construction of the newer American and European projectors; but after serious reflection we wonder if these same valuable features could not have been somewhat modified for incorporation in smaller, more compact, mechanisms without certain nonessential frills and refinements which add to the complexity and cost of motion-picture machines and nothing to the picture on the screen.

Are the frame castings as simple and "clean" as they might be? Could not the number of gears be reduced, and their accessibility improved? Are the smaller parts, such as the guide-roller assemblies, too complex? Is the number of screws and bolts unnecessarily large? Is the fine-trim shutter adjustment necessary? (Once the shutter rotor has been fixed on its shaft in correct relation to the cycling of the intermittent, it seldom needs to be touched again.)

Considerable simplification of mechanism gearing seems possible in some cases. Simplification of intermittent framing depends on maintaining the correct shutter-intermittent relationship at all positions of the framer without need of automatic compensation of the shutter (Simplex) or the intermittent (Motiograph). Such compensation is absolutely necessary in rotating-movement framers, and is difficult to avoid in vertical-carriage framers.

In an attempt to eliminate all framing gears, cam rings, rack-and-pinion framing carriages, etc., the manufacturers of certain low-priced and portable 35-mm projectors have interposed between the intermittent sprocket and the film gate a moveable roller against which the film is held taut by the gate-pad tension. The intermittent movement remains fixed, neither moving up and down nor rotating in a cam ring during the framing operation. The roller frames the picture. As the roller is moved farther into the film path, the film is pulled down in the gate, framing "up" on the screen.

The disadvantage of this simple system would seem to be the possibility of slight film flutter at the roller, causing slight unsteadiness of the picture. The writer has operated several projectors having this type of framer, however, and no unsteadiness of the image attributable to this cause has ever been observed. Naturally, the framing roller must be reasonably large in diameter, precision ground, and free from looseness or play on its shaft. Also, the intermittent sprocket and framing roller must be positioned as close to the film aperture as possible to minimize verticle weaving caused by varying film shrinkage.

This framing method is worth investigation with a view to simplifying projector construction and reducing the price of new projectors. Until the price of new machines is reduced, exhibitors will go on and on buying good second-hand Simplex X-L's and Motiograph AA's which have been made available at a low price by theatre closings.

American and European Design

Disregarding for the moment the optical sound reproducer (considering only the picture-projecting portion of the projector), gearing must be provided to drive the intermittent movement, the rotating shutter, the upper (feed) sprocket, and the lower (holdback) sprocket. The arrangement of the gearing depends upon (1) the arrange-

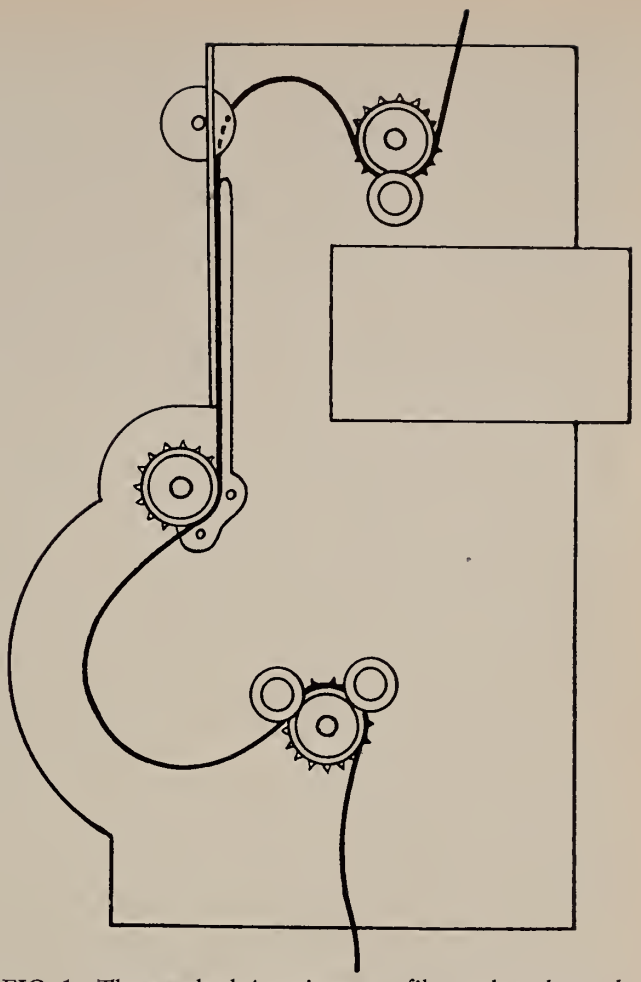


FIG. 1—The standard American-type film path and sprocket arrangement in a projector mechanism as exemplified by the Simplex Regular mechanism (originally the Edengraph of 1909).

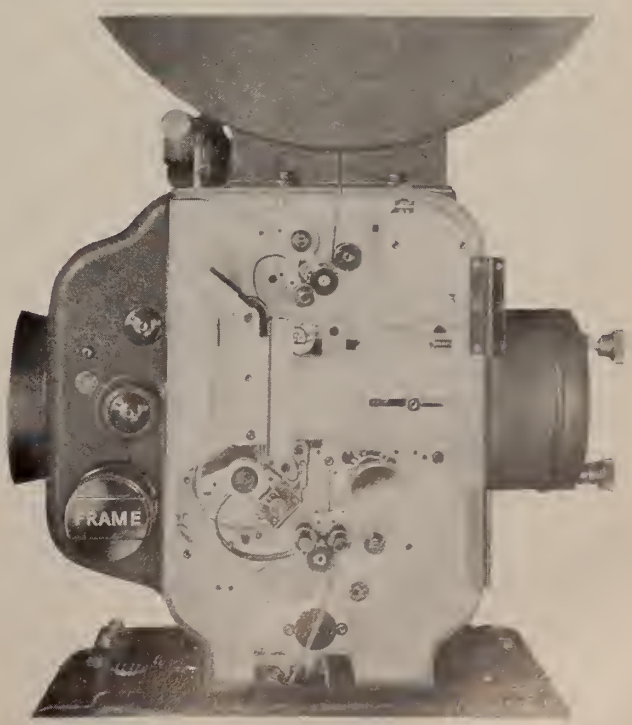


FIG. 2—Standard American projector design as incorporated in the modern Motiograph AA and AAA mechanisms.

ment of the sprockets and shutter, and (2) the type of drive favored by the designer.

The placement of film gate and sprockets — that is, the configuration of the film path through the mechanism, — is more or less standardized by two principal plans, the American and the European. Each film path includes an upper loop between feed sprocket and gate, an intermittent sjrocket positioned as close below the aperture as possible to minimize jump caused by varying film shrinkage, a lower loop between intermittent and holdback sprockets, and in some cases an optical sound reproducer as an integral component of the mechanism, *as it always should be.*

The American type of film path was established by the original Edengraph, which became the Simplex Regular (Fig. 1). This film path is found in all Simplex models, the Brenkert, the Motiograph AA and AAA, the DeVery (except for the inclusion of an integral sound-reproducing unit), the Wenzel, Kaplan, Ace, Gardiner, and certain Holmes models. The earlier Motiograph models (up to and including the Model K) and the Powers are among the more famous American projectors having film paths different from the standard Simplex configuration.

The rotating shutter of the early Simplex represented by Fig. 1 is not indicated because the shutter may be placed in front of the projection lens, behind the gate, or in both positions as a double shutter. Moreover, different types of shutter are used in standard American mechanisms — single-rotor disc, double-rotor disc, cylindrical (barrel), or conical (dished).

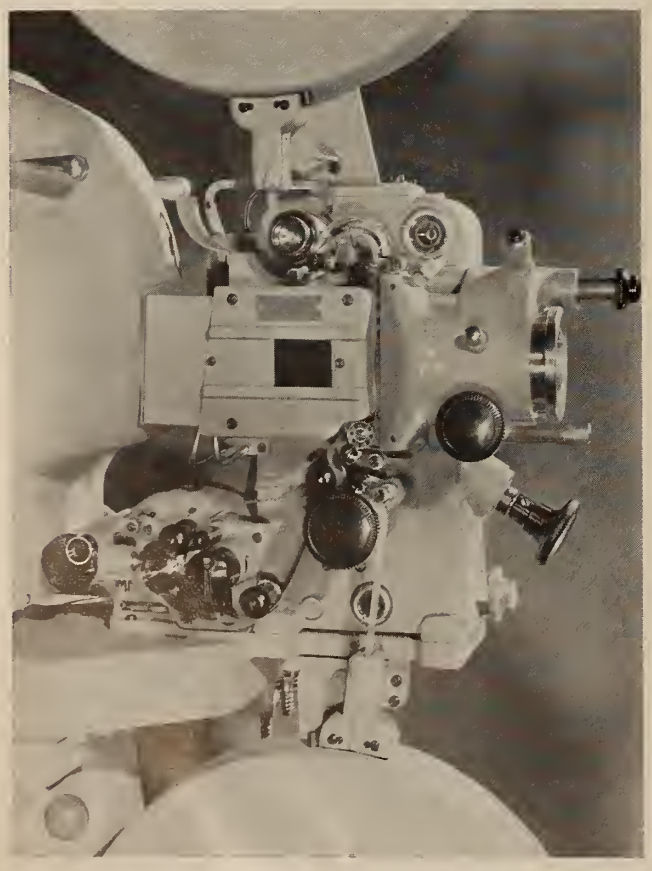


FIG. 4—Standard European projector design as incorporated in the modern Philips FP-6 mechanism. (Note the optical sound attachment behind the picture head. It has no sprockets or gears. Flutterless sound reproduction is assured by a perfectly damped sound takeoff drum and snubber rollers.) Philips projectors are outstanding theatre machines.

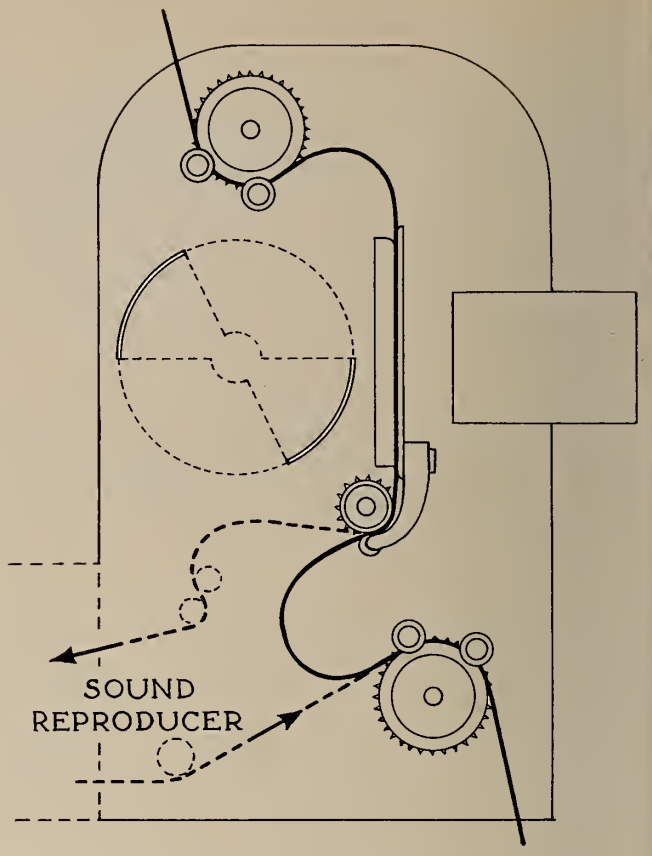


FIG. 3—The standard European-type film path and sprocket arrangement as exemplified by the German Ernemann II mechanism (originally the Imperator of 1909). The mechanism is shown threaded for either silent or CinemaScope magnetic-track film. The optical reproducer is a sprocketless attachment to the rear; and when used, the lower 32-tooth holdback sprocket of the picture mechanism serves as a combination sound and takeup sprocket.

A signed engineering report in the writer's files indicates that double-rotor disc shutters (rear), cylindrical, and conical shutters have very nearly the same light-transmission efficiency, amounting to 56% of the light flux with only a little "cheating," but no perceptible travel ghost under indoor-projection conditions.

The type of film path established in European practice seems to have originated in the German Imperator "steel projector," forerunner of a long and famous line of Ernemann projectors. Curiously, the Imperator was produced by Alexander Ernemann about the same time that Francis Cannock produced the Edengraph (Simplex) in the United States (1909). Most other European projectors, particularly those of German, Dutch, and Swedish manufacture, employ the same film path (Fig. 3). These include all Zeiss-Ikon Ernemann models, the Bauer, Euro, Philips, Askania, Aga-Baltic, Bofa, Walturdaw, Kalee, and others known to American projectionists at least by name.

Most European projectors are open mechanisms, although a few manufacturers produce alternative enclosed mechanisms, most employ 32-tooth feed and holdback sprockets, most contain a *sprocketless, gearless,* film-driven optical-sound reproducer as a compact unit behind the lower sprocket, and the great majority have

Please turn to Page 14



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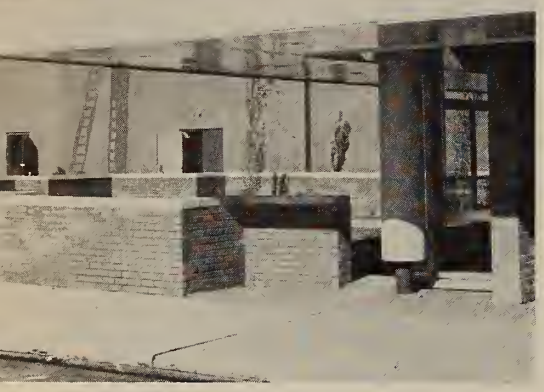
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Section of the front of the Cinema, which rises 35 feet high and has strong visual attraction for motorists on U. S. No. 1, which the theatre faces.



Cinema Theatre Movie Showcase For Menlo Park Shopping Center

MENLO PARK, N.J.—Following the current trend, the new Cinema Theatre is a unit of the new shopping center here. The Park Regional Shopping Center, of which the Cinema is part of the attractions to the community center, is located on heavily traveled U.S. No. 1, which means that not only has the theatre ample parking space, but its visual draw to passing motorists is an advantageous patron-attracting factor.

It is the latest unit in the circuit operated by the General Drive-In Corp. of Boston.

The Cinema has a capacity of 1,600 seats on the orchestra level and the balcony. The projection and sound equipment is of the highest standard

The booth is equipped with 35 mm Century Projectors, Ashcraft Super Cinex arc lamps. Ashcraft rectifiers, RCA multiple channel sound equipment, Bausch & Lomb projection lenses, and Neumade rewind room equipment.

The screen, 26 by 58 feet, is the Hurley Super Optica Lenticular 60 in. screen.

Capital Motion Picture Supply Co., of New York, installed the equipment, including the Griggs push-back chairs, which are the deluxe loge model.

The Cinema's contemporary architecture was designed by Elliot Willensky, who heads the Architects Design Group, New York.

The auditorium, designed in collaboration with theatre consultant Ben Schlager, features a white-walled treatment for the screen to reflect the predominant color values of the projected image and attempts to extend the image as far as possible to-

Please turn to Page 17

An exterior photo of the Cinema, Menlo Park, N. J. The entrance is at the left and features a glass-enclosed reception lounge, 90 by 40-ft. Constructed of red brick, set in black mortar, glass and reinforced concrete roof.





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C. E. Heppberger

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For quality projection, use "National" projector carbons—for dependable, free technical service, call NATIONAL CARBON. Get details from your NATIONAL CARBON supply dealer or write: National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada:* Union Carbide Canada Ltd., Toronto.



OPTICAL ALIGNMENT DEVICES: The use of this equipment results in restoring to a screen the light lost through imperfect alignment of the optical system.

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Ed Lachman Alerting Exhibitors For Better Theatre Production

NEW YORK—Since he is a theatre owner as well as president of Lorraine Arc Carbon Co., Edward Lachman is doing a valuable job for better projection in addresses at exhibitor conventions around the country

Fellow theatre owners are more likley to accept his advice about the importance of projection and the need to correct faulty light on the screen than a technical man from a theatre equipment manufacturer or a prominent projectionist.

Lachman's speeches before these groups deals in a practical way to alert exhibitors to investigate the equipment for projection in their theatres and corrective measures "in cooperation with the carbon manufacturer, the projectionists, and the theatre equipment dealer."

Typical of Mr. Lachman's addresses before these bodies was his speed at the Arkansas, Mississippi, Tennessee Motion Picture Theatre Owner's Convention.

Mr. Lachman wished he could report that "all of the projection and lighting problems have been resolved and that all of our theatre screens are being filled with pictures that meet present day requirements, such as brightness. distribution and color rendition as the producer of the film meant them to be." Then he covered four problems with corrective measures for each as follows:

Screen Sizes

1. Are screens too large for the lamps being used? With the advent of the large screen technique . . . in many cases the screen area was increased by as much as 50 to 75% without any change in the lamp or carbon equipment. If the screen area is doubled, the screen will be only one fourth as bright. The recommended screen brightness has recently been increased to a minimum of 14 foot lamberts, and unless you have seen pictures projected at this light level or higher, you have missed some of the details, that make the Hollywood productions real works of art.

"It is difficult for us to tell the exhibitor that he should replace his lamps. We will however, make every effort to help him get maximum results from the existing equipment, and if it still fails to meet present day requirements, we then will suggest he contact his equipment dealer and see what can be done toward upgrading the equipment at a minimum cost.

"We believe that more than 60% of all the arc lamps now in use are more than 20 years old, and this complicates the brightness problem considerably.

Power Supply

2. Power supply bottlenecks which limit output. In some cases the existing lamps are satisfactory and would be capable of delivering more light if larger carbons and more voltage and current can be used. The answer here is to obtain larger rectifiers. When using a motor generator, the terminal voltage should be 20 to 30% higher than the actual arc voltage in order to provide proper stability to the arc by means of the ballast resistor. If the arc voltage is raised at the expense of this stabilizing voltage, an improper operation will usually result, causing excessive sputtering, etc, and possible overheating and damage to the generator. If you are considering the purchase of a new rectifier or generator equipment, expert advice should be sought regarding its voltage and current characteristics. Both projectionist and equipment dealer should be consulted. Inasmuch as the operator must work and live with this equipment, he should be a party to its selection.

"We are constantly amazed at the number of installations we find where perhaps it was considered unimportant whether single phase or three phase equipment be used. In these theatres the exhibitor wonders why there is a change in light intensity at random intervals. This is the result of a constantly changing voltage on the single phase supply, due to the on and off nature of the electrical load in the theatre or the immediate vicinity.



Edward Lachman

Maintenance

"All power equipment, generators or rectifiers require a certain amount of maintenance. routine cleaning and proper ventilation . . . this last item, ventilation, is often overlooked, and is one of the most common causes of failure in this type of equipment. Excessive heat is the deadly enemy of such equipment.

"The carbon manufacturer must make a variety of carbon sizes to operate in the many types of lamps and for the different voltage and current requirements. A major design objective is to make the shell and the core burn away at the same ratio so the crater will always be the same size. The reflector is focused to the gas ball, which is the brightest known source of light for a given size.

Screen Surface

3. The type of screen surface to buy and when to replace your present screen are of equal importance. The classic example of screen replacement policy is that of Radio City Music Hall. They have what is probably the world's largest indoor screen, and it is replaced every six months, or sooner if necessary. They realize that the present pressure of heating and cooling systems, the inevitable backstage dust, etc., causes a deterioration of the screen surface. We are very proud of the fact that this theatre . . . is now in the 16th year of continuous use of our Lorraine arc carbons. When your screen reaches the point where it fails to do justice to the projected light, we hope you will give proper consideration to its replacement.

Reflector Breakage

4. Miscellaneous problems. One of the greatest problems in the projection room today is reflector breakage — associated with improper lamp ventilation or improper care of the reflector. It can be proved that they can be heated almost to the melting point without breaking if they are heated slowly and cooled slowly and if there are no areas covered with ash or soot that would make these sections heat or cool at a rate different from the other sections. Carbons are never responsible for breakage of mirrors; ash accumulation, mounting details and improper venti-

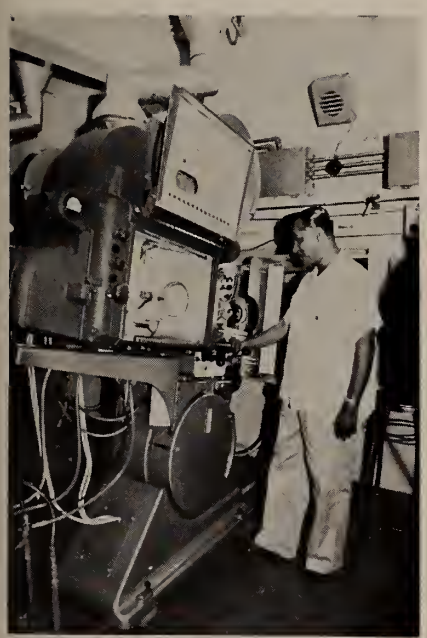
lation with heat pockets are responsible.

Stack Draft

"All lamps are designed to work with a certain amount of stack draft . . . it is amazing how many lamps we find poorly ventilated, with paint burned off, feed mechanism and contacts damaged and perhaps with a bad record of reflector breakage all because the original installation did not provide adequate stack draft.

Check Carbon Waste

"One of the most important jobs that can be done for you by a carbon field man is to adjust your lamps so there will be a minimum of carbon wasted. Patience and know-how are required to get the maximum light with most economical burning rate," he concluded. **iP**



SINGAPORE THEATRE INSTALLS PHILIPS/NORELCO—The world-wide popularity of Philips/Norelco 70 mm projection equipment was demonstrated recently in the city of Singapore, Federation of Malaya, where the Odeon Theatre selected this equipment for its booth. Almost every nation in the free world now has at least one Philips/Norelco equipped theatre. In the U.S. alone, there are more than 130 theatres including a number of drive-ins with Norelco projectors.

BalCOLD® REFLECTORS CUT HEAT IN HALF

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ENGLAND'S CHANGING SPHERE OF THEATRE PROJECTION

By STANLEY T. PERRY
Projection Supervisor, M.G.M.,
London

It was in the fall of 1954 that "Cinerama" opened at the London Casino to rave reviews and sensational business, which has continued right up to the present time. The theatre is currently playing "This Is Cinerama," which originally played for 18 months, the Casino having presented the succeeding four Cinerama films.

The public's appetite being whetted by Cinerama made "Around the World in 80 Days" a natural and the picture played at the Astoria Theatre in London's West End for two years.

However, it is "South Pacific" which holds the record to date. Now in its fourth year at the Dominion Theatre, it has broken all records for consistent business.

If proof is needed that "the gimmicks" are here to stay, it is surely demonstrated by the fact that "The King and I" in 70mm at London's Victoria Metropole Theatre has been packing them for weeks. The picture, released in CinemaScope and four-track magnetic sound, broke records in practically every theatre which played it.

Up and down this country more than 45 theatres are equipped with Philips Norelco 70-35mm projectors and six-track stereophonic sound, with other installations pending.

My purpose in outlining the foregoing is to put readers "in the picture" so to say, with regard to what has happened since the advent of new and improved methods of presentation in this country.

Automation is now an established fact in many cinemas here in varying degrees. Two theatres, one in Preston, an industrial city in North England, the other in a suburb of London, are fully automatic and have been running successfully for two years and one year, respectively.

The writer attended a demonstration at the London house; he attended to criticize, but remained to praise. The equipment did all that was claimed for it. A subsequent paid-admission visit to a regular show showed again the results could not be faulted.

I believe that automation in the field of motion picture projection, should be reviewed by a panel consisting of representatives of all sections of the industry, even at this early stage. It must be agreed that what applies to other electro-mechanical trades and professions could well, in time, apply to us.

The snags and queries of automation should be considered now in the light of the manpower problem which would surely manifest itself in no uncertain way.

The equipment in use at the two theatres concerned is Philips 35mm projectors fitted with 6,000 ft. magazines and the new cold "pulsed light" system and a control console placed in the front circle, from which one man virtually runs the show.

The consoles were devised and manufactured by the projection-engineers department of Associated British Cinemas, owners of the theatres, and the engineering department of J. Frank Brockliss, Ltd., agents for Philips projection and sound equipment in Great Britain.

The console operator can raise and lower house and stage lighting, also curtains and screen masking to any desired aspect ratio: start and stop projectors; control focus and masking; change-overs; play records on non-sync for intermissions, etc. Sound can be faded in and out and the volume controlled according to audience and type of film playing.

Thus only two men are required to put on the show, one carrying out the console duties, the other in the booth, threading the projectors, rewinding film and maintaining ampli-

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Free Carbon Chart

There is also a device known as "Projectomatic". A British invention, this has been installed in a large number of cinemas in Great Britain. No console is used with this equipment. all of which is contained in the booth.

It consists of a large metal box that operates, at the appropriate time, electrical impulses which in turn operate the various pieces of equipment to which they are connected. The pegs in the drum are pre-set on every change of program, or for an alteration in the timing of the show. Although not so comprehensive as the Philips setup, the Projectomatic has been in use for nearly 10 years and has found favor with theatres both large and small.

The Projectomatic is continually being modified and improved, and this would seem to indicate that the manufacturers, G-B Kalee, Ltd., have faith in their product, which can be used in conjunction with all types of projection and arc lamps. It strikes the arc by means of a metal pellet, previously inserted between carbons by the projectionist, which fuses when current is switched on. As the efficient operation of Projectomatic rests on the smooth working of the timing device, i.e. the drum, in the event of failure in any way a cut-out switch ensures that all the automatic processes are returned to manual working.

Seemingly, we have come a long way since the introduction of CinemaScope and "wide screen." There are those who sigh for the good old days of straight projection with no gimmicks. Even so, it must be admitted that 70mm and six-channel sound has proved a welcome shot in the arm to the box office take and there appears to be no letup in the super epics in the new medium.

Projectionists have, as usual, accepted these methods of presentation and have taken them in their stride, with varying degrees of appreciation on the part of exhibitors. Even so, I would hazard the personal opinion, and I am not alone, that we are only at the beginning of what I have titled this article, and that many of us will see further surprising screen developments in the not too distant future.

No doubt TV was the primary cause for the closing of many theatres in the U. S. and this country. But let us face it, only the best is good enough today. And that goes double for projection and sound. Increasing attention to accommodate replacement of screens, more efficient lamps and lenses. These have come our way and have been thankfully received.

Already some of our booths are beginning to assume the appearance of "shape of things to come." Projectionists are likewise ready for what is to come, and this time it won't be stage shows and spot lights — remember Benograph and slides, organs, and more slides? But why dig up the dear, delightful past, instead of wondering what the new year holds for us. **iP**

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Better Light!
Lower Costs!
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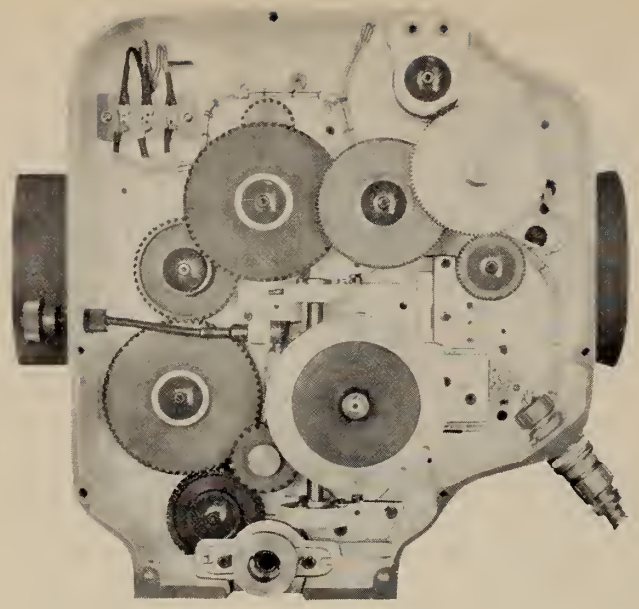


FIG 5—The straightforward planar driving gears of the Motiograph AAA mechanism, the "Rolls Royce" of American projectors. The heavy flywheel visible in the picture is attached to the shaft of the intermittent cam. The shutter is of the compact, double-cutoff, highly efficient cylindrical type.

PROJECTOR DESIGN

from Page 6

cylindrical shutters placed directly behind the aperture of the film gate (shown in Fig. 3).

The tremendous popularity of the compact, neatly geared, efficiently double-acting cylindrical shutter in Europe may surprise those American projectionists who have come to regard the relatively cumbersome disc-type shutter as the norm.

Two American manufacturers have replaced the small 16-tooth feed and holdback sprockets of their 35-mm machines with the larger 24-tooth size of sprocket. Even this does not quite match the European 32-tooth sprocket in size. European projectionists prefer the larger sprokets because they are less likely to damage the film perforations, a distinct advantage when heavy 4,000-ft.—6,000-ft. reels of film are projected. At any rate, it is obvious that 16-tooth feed and holdback sprockets (or 16-tooth soundhead sprockets) are too small, and must be regarded as generally undesirable for reels containing more than 1,000 feet of 35-mm film.

Planar and Orthogonal Gearing

There are two general types of drive gearing, the "planar" having all gears and pinions in parallel planes, and the "orthogonal" type employing gears which mate at right angles to each other. Most projectors employ both types together, with one or the other predominating. A third type, not much used in 35-mm machines, is the chain drive. This is found in the American DeVry projector and in a couple of European machines.

The Motiograph AAA (Fig. 5) employs straight forward planar gearing exclusively, except for an othogonal pinion which drives the intermittent, and which is vertically moveable for automatic compensation of the shutter-intermittent relationship in framing. The Brenkert models are also planar driven except, of course, for the disc-shutter shaft. Brenkert projectors are well worth examination as superior examples of machine construction — they are beautifully built and exceptionally rugged mechanisms.

The Simplex Regular and Super Simplex have planar gearing for the main drive, and two orthogonal shafts at right angles to each other for the upper feed sprocket and the disc shutter.

The Simplex E-7 (Fig. 6) and X-L make more extensive use of orthogonal shafts for driving the main components of these mechanisms. Fig. 7 is a photograph of the massive orthogonal drive gearing of an European picture-and-sound mechanism, the Philips FP-7. (See Fig. 4 for the film path of the Philips FP-6 and FP-7 mechanisms.)

The heavy-duty gearing of Philips projectors is worthy of note, as is also the planar gearing of the American Motiograph and Brenkert projectors. The modern American Simplex X-L is also worth special study for a full appreciation of its precision mechanical construction and *inclined* orthogonal drive. Note, also, the *angled* orthogonal shaft which drives the conical shutter of the X-L.

Why Separate Soundheads?

There is no logical reason today, 35 years after the standardization of optical sound-on-film, why motion-picture mechanisms should be designed as silent-picture heads to be mounted upon heavy, bulky, individually compartmentalized soundheads. Can you imagine a silent 16-mm projector manufactured to be mounted upon a separate optical reproducer? I can't; and neither can any manufacturer who hopes to sell his 16-mm sound projectors.

Most European theatre machines (even those with attachable sound units) and the American DeVry (not

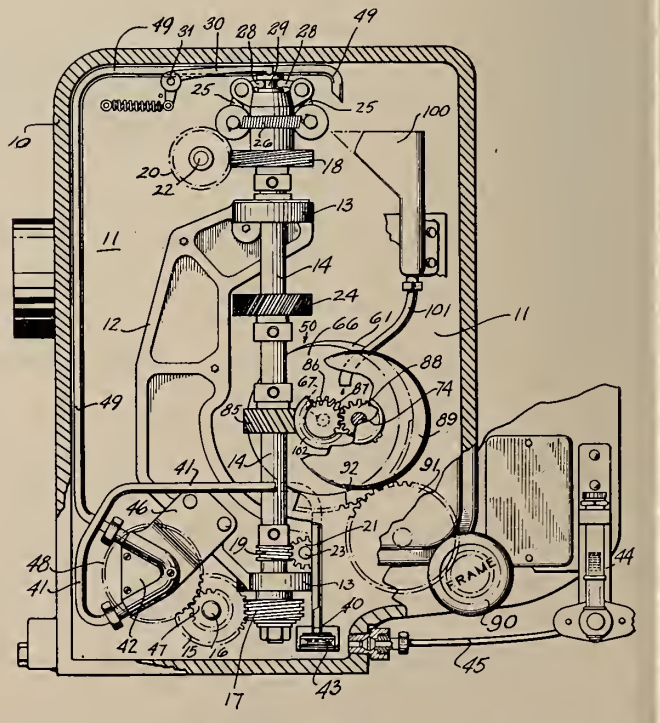


FIG. 6—The orthogonal driving gears of the Simplex E-7 mechanism. The gears of the orthogonal (vertical) shaft drive the upper and lower sprockets, the shutter, and the intermittent movement.

to mention the Simplex SP and Holmes semiportables) demonstrate the feasibility of eliminating the separate soundhead and using, instead, a simple sound takeoff built into the picture mechanism, itself.

With snubber or damping rollers of adequate design, no gear-driven sprockets are needed. In fact, no sprockets at all are needed in a sound reproducer. It is only necessary to provide a suitable film path which allows a length of 15 inches of film (20 frames) from the scanning point on the sound drum to the corresponding picture frame at the aperture, and using the holdback sprocket of the picture mechanism as the "sound sprocket."

The design of 16-mm optical-sound projectors for home, school, and TV use offers valuable hints to the designer of compact 35-mm sound-takeoff units. The cylindrical-lens optics without a sound slit, the single-wire exciter filament, and a phototransistor cell positioned inside the scanning drum make for remarkable compactness, dependability, and high-fidelity sound reproduction. The excellent high-frequency response and minimal flutter of good 16-mm sound reproducers indicate what could be done in the 35-mm field without the use of unwieldy and unnecessarily complicated soundheads having gear-driven sound and holdback sprockets. Indeed, CinemaScope magnetic reproducers have amply proven that a "floating" film drive is entirely adequate for excellent reproduction.

What of such "refinements" as automatic fire shutters, automatic lubrication, curved gates, and water-cooled apertures in a simplified, more compact, less expensive 35-mm projector mechanism? This writer regards all of these as absolute necessities, not as frills. Fire shutters are necessary even in these days of safety film to guard against "burnouts;" but their construction should be simplified, and they should be designed to do double duty as changeover dowsers to save space, parts, and cost.

Lifetime-lubricated sealed bearings, or "splash lubrication" of the drive gearing should be a feature of every picture-and-sound mechanism. And likewise for *curved* gates designed for water cooling whenever high arc currents require this extra protection to the film for sharper, more consistent focus on the screen.

"Automatic Projection" a Farce

Nothing has yet been said in this article about "projection automation" for the simple reason that automation (such as it is) is something that is *added* to a regular motion-picture machine. But now the time has come to express an opinion on this zaniest of all proposals to alter the projection process.

A projection "automation" is nothing but a timed-switch complex design to start and stop the lamp and projector motor, make the changeovers, and even to operate the house lights and music phonograph. Such an automatic system is complicated, often troublesome, and requires more maintenance work and outlay of money than standard equipment operated by projectionists.

Besides, who is to service the prints and oversee the operation of this extra paraphernalia if not the projectionists who formerly controlled all switches manually and with expert judgment?

Who inspects, repairs, and rewinds the prints in an automated projection room? Who changes apertures, lenses, and anamorphic optics when required, and makes other necessary adjustments? Who services, adjusts, and repairs the projectors and sound equipment, the lamps, lenses, rectifiers, generators, motors, rewinds,

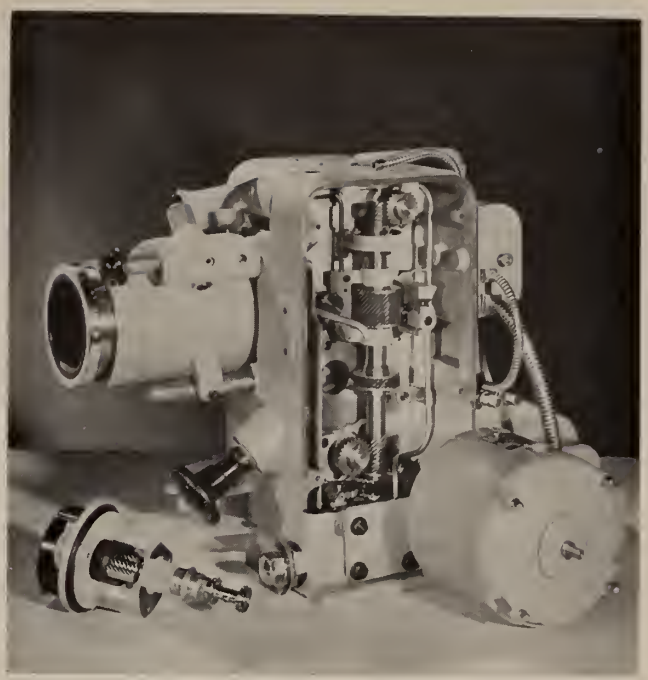


FIG. 7—The massive, precision-machined orthogonal gearing of the Philips FP-7 mechanism. Like the American Motiograph, the FP-6 open mechanism and the FP-7 enclosed mechanism with built-in optical reproducer employ the cylindrical type of shutter.

splicers, automatic timers, relay switches, etc. if not a trained projectionist?

Is a "trained observer" in the audience, comfortably seated and so absorbed in the show that he may neglect his vital duties, a better man to focus the picture by remote control and correct the sound level than a competent projectionist in the booth who is alert and attending to his job at all times, and whose sole stock-in-trade is the maintenance of picture and sound quality through professional competence and experience? Decidedly not.

The craft need have no apprehension anent the possibilty of a self-threading device for theatre projectors. No one has yet marketed such a device even for 16-mm sound projectors! There is a vast difference between a silent 8-mm home-movie machine — a mere toy — and a 35-mm or 70-mm theatre machine equipped for both optical and magnetic stereophonic sound and for big-screen projection via the most powerful carbon-arc lamps. Threading the projectors is probably the easiest of the projectionist's manifold duties, and one that he invariably performs quickly and accurately year in and year out.

Projection and sound quality are definitely endangered in automated projection because of the increased likelihood of breakdowns and show stoppages through lack of operational supervision. We may as well speak of automated carpentry or automated surgery as of truly satisfactory automated projection in motion picture theatres!

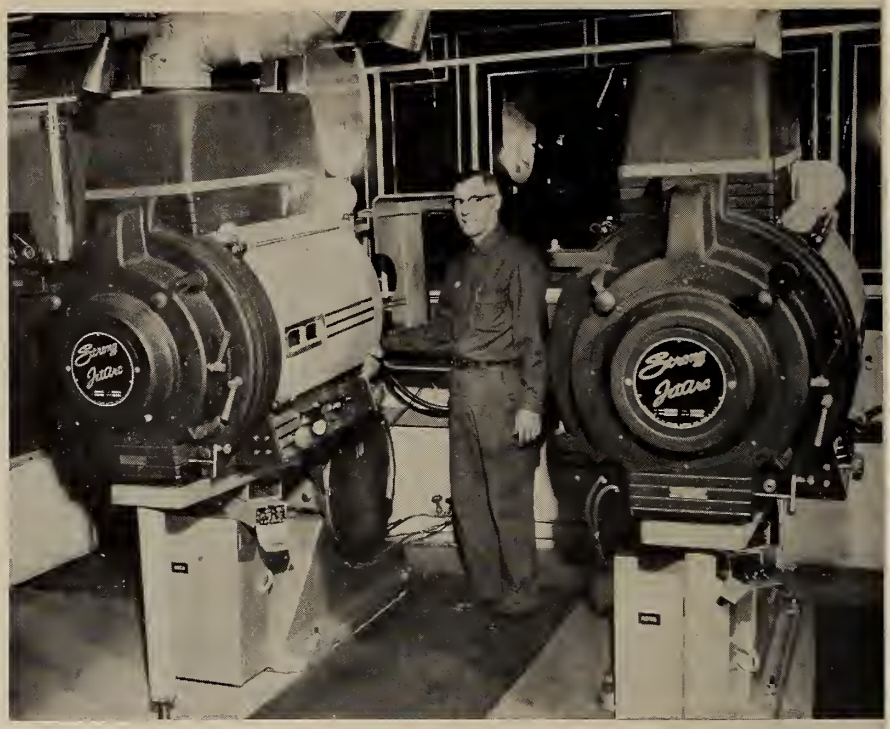
This writer here reiterates his firm conviction that the living projectionist is absolutely indispensable to the technical success and economic life of motion-picture exhibition, and always will be. Without the skilled, highly trained projectionist there can be no professional presentation of motion-picture entertainment.

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37TH ANNIVERSARY — The installation of Strong Jetarc projection lamps in the new North Star Drive-In Theatre, Denver, Col., marked the 37th anniversary of operating projection lamps for Charles W. Decker, Local 230. Decker also was reminded that he was born upstairs over the first "Nickelodeon" in Akron, Ohio. The newly opened North Star has a capacity of 1,650 cars, and is owned by the Wolfberg Circuit. The Strong Jetarc lamps are used with 35/70 Norelco projectors to project a picture 137 ft. wide at a distance of 550 ft.

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"PACIFIC PANORAMA"

By Hank Boldizsar

We spent one-day with the gathering of the clan out among the sands of Yucca Valley—quite a favorite area with many projectionists in this coastal area who have acquired government homestead land (5 acres) and build cabins for weekend retreats. Guy Bridge and Bud Martin of Local 150, Lon Bennett of Long Beach Local 521 and Ralph Adams of Santa Ana Local 504, to name a few, are among those of us who journey to this desert clime for a rest away from smog and freeway.

A visit with Ellis Everett at his Sky Drive-In Theatre is always a must when we are in Yucca Valley. Ellis and Mrs. Everett came to the High Desert from Edwards Air Force Base two years ago and acquired the Sky Drive-In.

The one problem is the mountain moonshine, not the "drinking stuff," the lunar variety. The night of my visit was especially difficult for outdoor projection. A full moon is never welcomed by drive-in projectionists in the desert.

Ellis has some very ambitious plans for enlarging and improving the theatre. Plan #1 scheduled for this year will be to make the Sky a Drive-In/Walk-In Theatre for the added comfort of his patrons. A building of about 30 ft. x 60 ft. will be erected for people who prefer to leave their cars and view the screen from a comfortable air conditioned building.

We ran into an old friend at the theatre, Mrs. Pauline Hanson, wife of

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Brother Ole Hanson of Santa Ana Local 504. Pauline has lived in Yucca Valley for three years and incidentally is an old hand at operating motion picture equipment. From time to time she helps out in small town theatres where we big city lads would rather not go. Pauline accompanied the Local 504 crew (which included husband Ole) to the Brussels World's Fair two years ago, for the U. S. State Department's showing of the exciting Circarama. Ole and the crew remained with the show for a world tour sponsored by the State Department and has since presented Circarama from 10 a.m. to 10 p.m. to SRO audiences in North Africa, Russia, Afghanistan, Ceylon, India and many other countries.

The subject of women projectionists is to be avoided like the plague, but they do exist. Pauline has learned that a local on the East Coast has admitted a woman projectionist to membership and she would like to correspond with her. If the lovely lady is among our readers we would appreciate hearing from her.

* * *

Most of their faults women owe to us, while we are indebted to them for most of our better qualities.— C. Lemesle.

* * *

On the "Local Scene", the members of 150 elected to the executive board Harold Angel, Guy Bridge, Clem Marchand, Leo Stockwell and Red MacDonald. The principal offices of the local were uncontested.

* * *

The Stanley Warner Corp. announces construction soon of a new, 1200 seat theatre here in our La Mirada shopping center, and we understand this house, in the jurisdiction of Local 521 Long Beach, will be equipped with the finest in projection equipment — including 70 mm.

And down the road a piece in Orange County — sacred ground for Local 504 (Santa Ana) construction of a new drive-in will soon be underway . . . meat on the table. **iP**

QUARTERS ENLARGED

NEW YORK — An additional 5,000 sq. ft. has been added to the present quarters of S.O.S. Photo-Cine-Optics, Inc. The new space at 605 W. 51st Street adjoins the present structure which has been occupied by S.O.S. since 1947. This brings the total space occupied to over 25,000 sq. ft. The expansion of the S.O.S. Rental and Service Department since early this year has made the acquisition necessary. **iP**



The auditorium, with the booth centered above the balcony. The push-back chairs are upholstered in red on the orchestra level and in gold colored fabric in the balcony. To provide necessary exits, the balcony sweeps in an arc to stairways on either side of the screen.

Cinema Theatre

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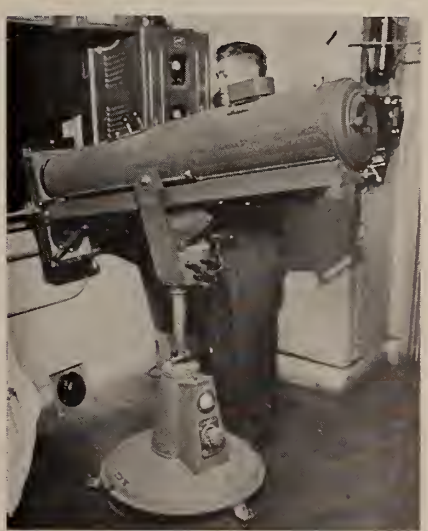
ward the audience. There are no curtains nor masking of the screen. The treatment is an adaption of Schlanger's design for the celebrated theatre in Colonial Williamsburg in Virginia, and the Murray Hill Theatre in New York.

The Cinema has a spacious reception lounge and art gallery which is enclosed in glass, an attractive convenience for people who may arrive in plenty of time for the start of the feature.

In order to hamonize with its suburban location, the theatre is contructed of red brick set into black mortor. The Cinema is fully landscaped around its perimeter and features a walled private garden into which the entrance pavillion opens.

The 35 feet high brick walls are carried to the lobbies. The brick acts as foils to the red carpeting and spiralling stairways to the balcony.

The architect of record for the building is Lathrop Douglass. Edward Klausner was the structural engineer. **iP**



LOUISIANA LIGHT — Joe Beasley, IATSE Local No. 540, is shown with the installation of an arc follow spotlight installed at the Gordon Theatre, Baton Rouge, La.

Dr. A. K. Chapman Heads Eastman Kodak Board

ROCHESTER — Dr. Albert K. Chapman was elected chairman of the board of directors of Eastman Kodak Co. succeeding Thomas J. Hargrave who died in February.

The Kodak executive joined the company in Rochester in 1919 and organized the development department at the administrative headquarters in Rochester.

Dr. Chapman was made a Chevalier in the French Legion of Honor in 1955. He was named to the United States Advisory Council for the International Industrial Conference. Dr. and Mrs. Chapman live in Pittsford, N. Y. They have two daughters. **iP**



Here is the 33-ft. panoramic screen designed for Norelco 70/35 mm film projection in the 664 seat theatre aboard new luxury liner SS France. Behind the screen are five Norelco loudspeakers for motion pictures, and in addition acoustic panels either side open as needed to release stereophonic sound through concealed column speakers.

Philips' Installations Equipment Luxury Liner SS France

Travelers on the new luxury ship, SS France, are being treated to wide-screen movie-viewing for the first time on any ocean liner.

Thanks to two 70/35 mm motion picture projectors by Norelco (North American Philips), ocean travelers may, as a change from ping-pong, shuffleboard or deck-chair socializing, enjoy "going to the movies" in the best big-theatre tradition. The liner's theatre is the largest theatre afloat and the best equipped on land or sea.

Continuous (14 hours daily) motion pictures, including the best and latest U. S. and European films and "spectaculars," are shown by Norelco's 16. 35/70 mm projectors with an especially designed Norelco high-fidelity stereophonic sound system on the theatre's 33 ft. curved panoramic screen for wide-gauge film.

Another luxury feature of the ship's motion picture system and another first in "movies at sea" is the simultaneous projection of films for private viewing on first class cabin television screens, and in public rooms throughout the ship.

Norelco's 70/35 mm projectors are now installed in more than 130 motion pictures theatres in the U.S.—ten in Hollywood alone.

At the heart of the television and acoustical installations is a nerve center or control room from which radio officers transmit throughout the ship selected musical programs (recorded or from radio broadcasts), orders and announcements, and television programs.

Four-hundred-and-fifty connections for television receivers give passengers in deluxe suites, first class cabins, and in the ship's public rooms a wide range of TV viewing. Within television range of either coast, passengers can enjoy French, European, or American programs. Also, within range of America, color television can be received on six special sets in the salons. In addition, live programs from the ship's studio (better equipped than most of those in Europe), and taped programs are available.

Philips' acoustical system, the most extensive ever installed on a liner, is comprised of three networks. The "crew" network, the network for "orders and announcements" and, of most interest to the passenger, the "concert" network which relays radio programs and recorded music as well as happenings aboard the ship. This installation enables the simultaneous distribution of seven different programs via eighteen different lines to crew rooms and passenger areas. Staterooms are provided with selector switches for a choice of programs. In all, nearly 1,500 loudspeakers are fed by this system.

In the theatre, seating a record 664 people, the two Philips projectors make available for the first time the projection at sea of wide-gauge panoramic films. Splayed walls in the theatre provide the ultimate in acoustic perfection for the stereophonic sound system which is supplied with five loudspeakers behind the panoramic screen and fourteen others strategically placed throughout the auditorium.

iP

Richard F. Walsh Heads Inter-American Group

Richard F. Walsh, president of the I.A.T.S.E., was elected president of the newly-formed Inter-American Federation of Entertainment Workers at its second Congress in Lima, Peru. He was represented at the sessions by International Representative Lester B. Isaac.

Objectives adopted by the Congress include:

(1) Greater interchange among the entertainment workers of North, Central and South America in order to spread their work and art. At the same time, it was agreed that native workers should be protected from displacement by those brought from other countries.

(2) Establishment of closer bonds among the organized entertainment workers of the various countries.

(3) Regulation of the use of video tape and other recordings to protect the rights of workers involved in their production.

(4) Aid for workers who die or become stranded away from their home countries.

(5) Promotion of the historical importance of national folklore. with fullest protection given to it by the governments of the continent. **iP**



HALF CENTURY — Celebrating his 50 years in show business, 42 of which he has been a member of IATSE and MPO, is Lawrence D. Lowe, Jacksonville, Fla. He is shown operating a Strong carbon arc follow spotlight in the projection room of the Roosevelt Theatre, and says that he feels at home with Strong projection lamps, having operated them for 29 years. Mr. Lowe has been a stage manager, worked on the road as an electrician with the Paul English Players, a dramatic stock company, and has been a motion picture operator for most of his half century in show business. He carries a Local #511 card.

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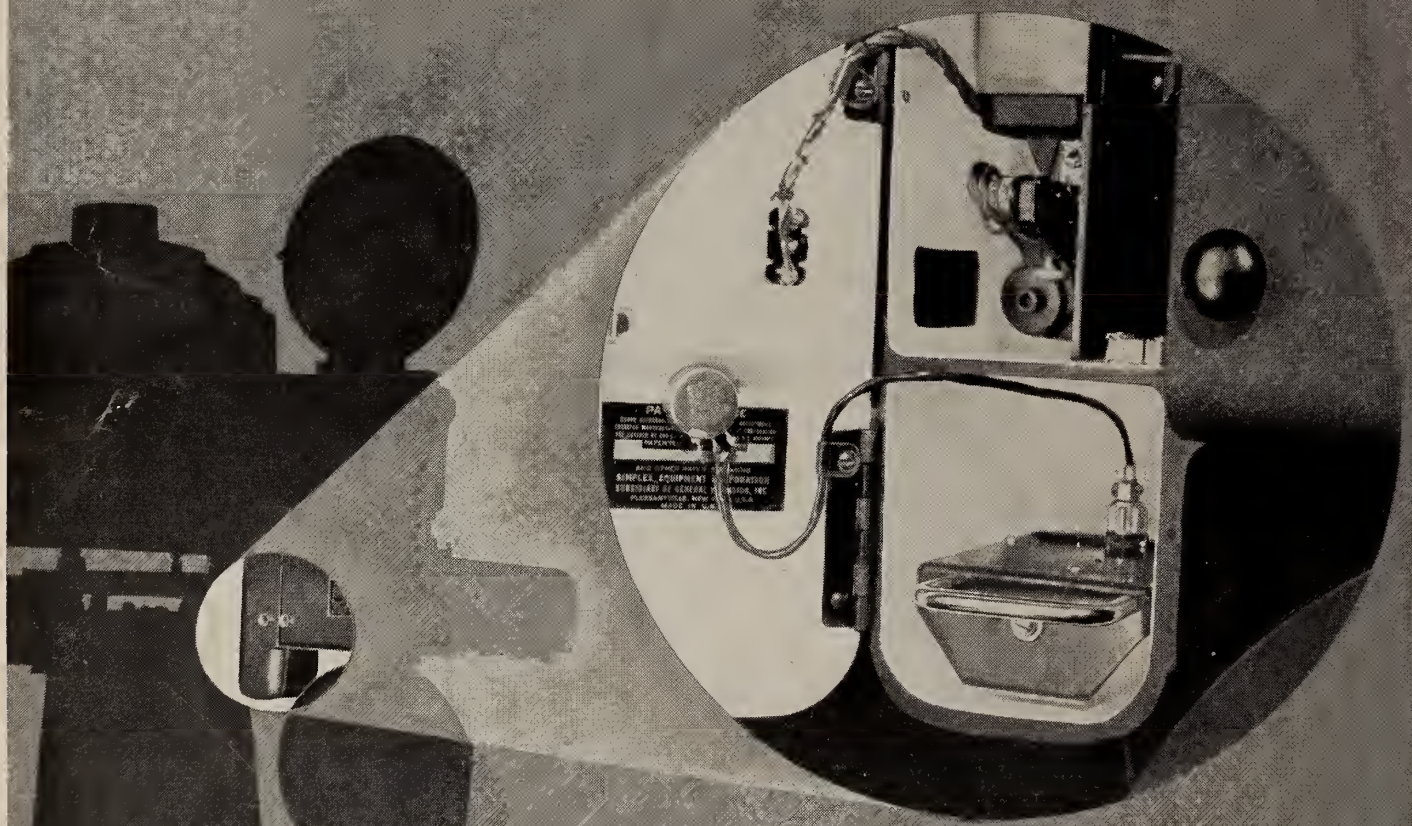
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Volume 37 July, 1962 No. 7

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

KEEPING UP WITH THE CRAFT

The projectionist must be a man of many talents; more so than ever before with complicated sound and electronic patterns emerging as a part of the projectionists' job in the major theatres. Since it is most difficult to obtain knowledge of the new developments without actually working in several ultra-modern projection rooms (or reading IP every month) the editors frequently publish brush-up courses. They are designed to reacquaint the practicing professional with the basic knowledge of aircraft, to up-date the younger operator.

A prime example is this issue's feature article by expert Robert A. Mitchell on electricity. There are many who will say "Ah, I learned all that in high school." We will bet a small cigar at Las Vegas that most projectionists will be unable to read Bob Mitchell's effort without thinking "That's right, I had forgotten" or "let's see if we can get better performance out of the three-phase in this case."

If you agree, there will be more of the familiarization type of article, including some actual nuts-and-bolts discussions of the equipment you are working with day in and day out. If you don't agree, we'll take our lumps from you cheerfully.

SUPPORT FOR IATSE

Projectionists will want to make plans to attend the 46th convention of the IATSE in Las Vegas Sept. 10 not only for the "fun and games" for which this desert metropolis is famed, but also to lend their support to IA in its emphasis on employment opportunities. Such opportunity in motion picture projection and, secondarily, film production has been uppermost in the minds of IP readers for the past decade, as they have seen their representation lose out in television projection, many drive-ins, and in the far flung production sites here and overseas.

Much of the IA time will be devoted to other segments of the alliance, but the operators and mixed locals including operators have as great a stake in the future of the motion picture industry as others have in the continuance of the legitimate stage (with its renaissance in the Vegas nightclubs!). Particularly in the smaller communities and the smaller locals, which obviously go together, the operators are seeing their members retire with no one to take their place. They also see their sources of employment dry up with no new theatres coming along. Happily for some, there is a rash of theatre building in suburban shopping centers and similar areas (see below), filling more than adequately the slacking off of the drive-ins (restricted by high land costs from the expansion which might be warranted by suburban development.) There is nothing on the horizon as yet which will solve problems for those projectionists in semi-urban areas, with few theatres, mostly mom-and-pop, and a general lack of product.

But motion pictures themselves are growing, and if pay tv can be held off long enough to permit the public to recognize that the best pictures are in their local theatres rather than on the idiot box, there will be continuing and increasing employment for all projectionists

(Continued on Page 11)

INTERNATIONAL PROJECTIONIST

Volume 37 July, 1962 Number 7

Alternating Current in Projection

By ROBERT A. MITCHELL

ONCE UPON A TIME, in the earliest days of the projection art, it was easily possible to present a movie show without using electricty at all. The projector was cranked by hand, and the picture was projected upon the screen (necessarily small) by means of a "limelight." This consisted of a "pin" of quicklime heated to incandescence by an oxy-acetylene flame. And, of course, there was no sound reproduction to require intricate electrical apparatus.

The passage of time has undeniably produced radical changes in the projection process. Electricity has become so necessary for modern sound-movie presentations that the projectionist must be an electrician and electronics engineer as well as a skilled mechanic, optical technician, film artisan, and master showman! The bygone days when many projectionists distrusted newfangled motor-driven projectors and automatically controlled arclamps that are now almost forgotten.

The modern motion picture, emblazoned in color on panoramic wide screens and accompanied by stereophonic sound, is powered by several pressures and intensities of both alternating and direct (continuous) currents. All these currents are derived from the 60-cycle (in Europe, 50-cycle) alternating electric power furnished to the theatre from the utility mains. The pressure of the mains AC may be 120 or 220 volts, and it may be single-phase or polyphase current.

Transformers, rectifiers, motor-generator sets, and sound-system power supply units are employed to transform the electric power (raise or lower the pressure or voltage) and to rectify it (change it from alternating to direct current) to meet the needs of the various components of the projection installation.

The proper functioning of all the power-converting units of equipment is decidedly the projectionist's responsibility.

In the early days of sound movies, the soundhead exciting lamps and amplifier tube filaments were sometimes powered by direct current from storage batteries. But the power was ultimately derived from the AC mains because the batteries were connected to a "trickle charger" which charged them with direct current obtained by rectifying alternating current.

The battery powered sound system this writer used to operate was an ERPI (Western Electric) system including the well-known "universal" projector bases and vacuum-tube control cabinets to regulate the speed of the motors. It required a projection room full of complicated "junk" to perform the most elementary functions.

Ohm's Law Spotlights Resistance

The principles governing the behavior of direct current (DC) are easy to understand. The two terminals of the source (battery, generator, or rectifier) have a "polarity" which indicates the direction in which the current flows—from the negative terminal (−) through the arc-lamp or amplifier circuit to the positive terminal (+). Electricians conventionally trace DC circuits from positive to negative, but in reality the current flows from − to +.

Impedance to the flow of a non-pulsating direct current is purely resistive. Connect a rheostat or resistor of low resistance (few "ohms") to a dry-cell, and a strong current flows through the circuit. Connect a resistor of high resistance (many ohms) to the same dry-cell, and

only a weak current flows. In other words, the higher the resistance, the greater the difficulty the current has in forcing its way through. And the weaker the current, the lower the pressure (volts). This, in essence, is the famous law of electrical resistance formulated about 130 years ago by Georg Simon Ohm.

More precisely, Ohm's law describes the relationship existing between the electromotive force (volts) and intensity of the current (amperes) as follows:—"The current in a circuit varies *directly* with the voltage and *inversely* with the resistance of the circuit." All we need do to find the number of amperes (I) in a circuit is divide the volts (E) by the ohms of resistance (R).

$$I = \frac{E}{R}.$$

Alternately, the volts and the ohms may be found by means of the following variants of the same formula. (Note that two quantities written together without a sign between them, as IR in the following, are to be multiplied: amps. x ohms.)

$$E = IR, \qquad R = \frac{E}{I}.$$

Inasmuch as Ohm's law usually comes up in projectionist examinations, it is a good idea to memorize these formulas.

"Watts" means "Power"

Electric power is expressed in terms of watts, and is represented by the letter *P* in formulas. A kilowatt is 1000 watts. In all *DC* circuits the watts are simply the product of the volts multiplied by the amperes. For example, a soundhead exciter which burns 5 amps. at 10 volts consumes 50 watts of power.

Your arclamps each have an ammeter to tell you how many amperes of current they burn. If you have a spare *DC* voltmeter to measure the voltage drop across the arc (connect the two prods of the voltmeter to the two lamp lead wires or terminals when the arc is burning normally), you can determine the number of watts consumed by the lamp. An arclamp burning 46 amps. with a drop of 38 volts, consumes 1748 watts of power. (The reading of the generator or rectifier output voltmeter should not be used for this determination.)

The three forms of the "watts formula" for DC circuits are:

$$P = EI, \qquad E = \frac{P}{I}, \qquad I = \frac{P}{E}.$$

Now a word of caution. The "watts formula" applies only to *DC* circuits, not to *AC!* If you multiply volts and amperes in an *AC* circuit, you will get "volt-amperes." This quantity may either equal the actual number of watts being consumed, or be much greater. In other words we must use a wattmeter to measure watts in *AC* instead of using separate voltmeters and ammeters and multiplying the readings. The reason for this is that the current and voltage in AC circuits are seldom "in phase;" and the more "out of phase" they are, the lower becomes the actual available power measured in watts.

As a matter of fact, an *AC* circuit containing only a choke coil with an iron core may give high voltage and ampere readings with separate meters, but throw the current and voltage so far out of phase that practically no power at all is consumed! This useless out-of-phase AC is called "wattless current," and is quite unlike anything encountered in DC circuits. So remember: to measure watts in an AC circuit, use a wattmeter.

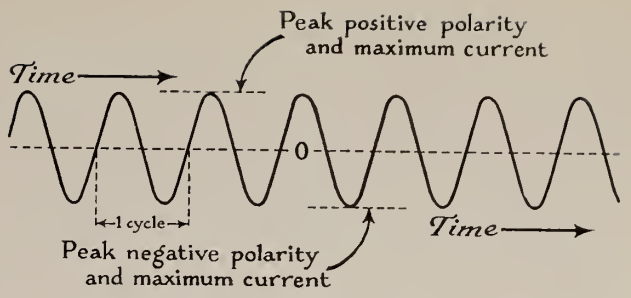


FIG. 1 — The simple "sine-wave" form ideally assumed by the periodically fluctuating and reversing flow of current and voltage constituting an alternating current. One complete period of the oscilloscopic curve—from positive to negative and back again—represents one cycle of the AC. Mains current is supplied at a frequency of 60 cycles per second in Canada and the United States—120 pulsations of power each second.

Alternating current obviously behaves in a manner more complex than direct current does. It pulsates and reverses its direction of flow many times each second, setting up electromagnetic fields which affect the characteristics of the current, itself.

The two terminals of a source of 60-cycle mains AC, for example, are alternately positive and negative 60 times each second—120 pulsations of power every second. This rapid rise and fall of the current, together with its equally rapid alternations of polarity, give rise to many effects never seen in circuits carrying non-pulsating direct current. But despite the complexity of the behavior of AC, it has many advantages not possessed by DC.

Projector Motors Usually AC

Most of the electric motors found in the average projection room are AC motors of either the "induction" or the "synchronous" type, usually the former. They will

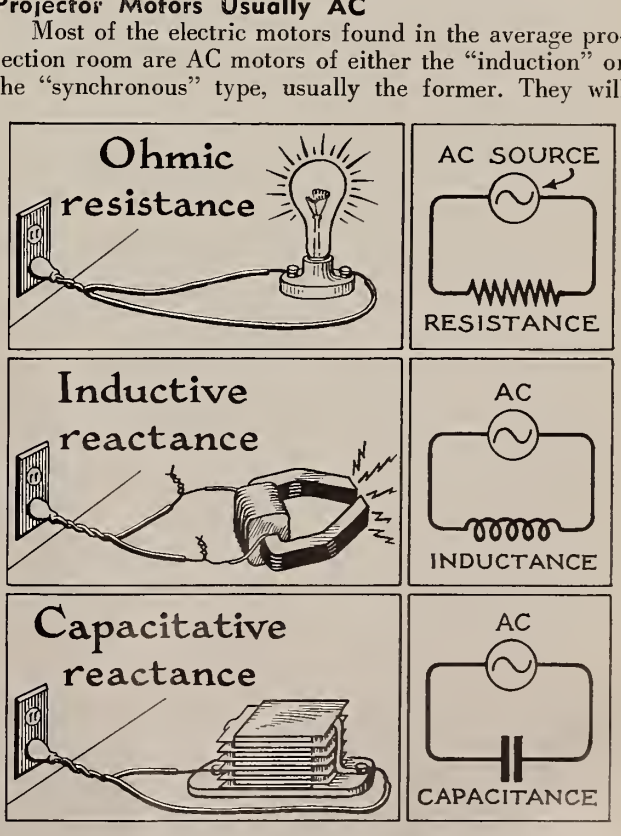


FIG. 2 — Elementary circuits illustrating pure ohmic resistance, inductive reactance, and capacitance reactance. The geometric sum of resistance and the two kinds of reactance constitute impedance in an AC circuit.

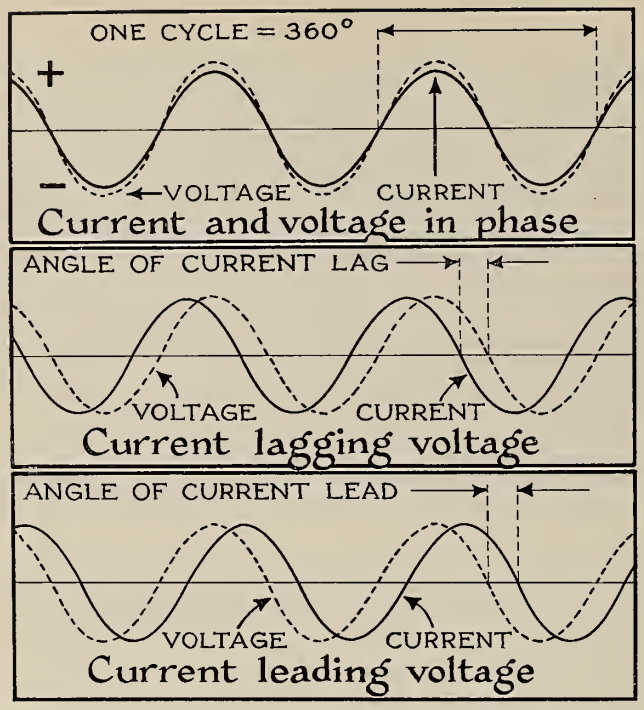


FIG. 3 — Pulsations of AC with (a) the current and voltage "in phase," (b) the current lagging behind voltage, the effect of inductive reactance, and (c) the current leading voltage, the effect of capacitative reactance. Alternating current gives maximum power (watts) when current and voltage are exactly in phase.

not run on direct current. Some of these, such as most projector and rewinder motors, run on "single-phase" AC, and accordingly have only two wires leading to them. Others, particularly the motors of motor-dynamo sets, use "3-phase" AC, and have three lead wires. Actually, the 3-phase motors are simpler, easier to reverse (just interchange any two of the three lead wires), less likely to get out of order, and certainly cheaper to manufacture in the larger sizes. Single-phase motors require a special starting winding and centrifugal cut-out switch: 3-phase motors start themselves, and do not need these extra circuits and special devices.

The circuits required for 3-phase current seem a bit more complicated than single-phase circuits, but polyphase operation of powerful motors and arc-lamp rectifiers is more satisfactory than single-phase operation. As a matter of fact, ¼-horsepower 3-phase induction motors operated on 220 volts are to be preferred to single-phase motors for driving projectors. Care must be exercised when working with 220-volt circuits, however, as this voltage is sufficiently high to be dangerous to life. Streetcars and subway trains are run on 500 volts; and this voltage will almost certainly kill if allowed to pass through the body.

In order to understand the nature of 3-phase AC, it is necessary to review briefly some of the peculiar characteristics of single-phase AC—characteristics not found in direct-current circuits. We learn, first of all, that simple ohmic resistance is not the only factor producing impedance to the flow of AC. There are two others, the result of the *inductance* of coils of wire and of the *capacitance* of conducting surfaces placed close to one another, but not in actual contact.The resistance-like effect of inductance and capacitance is called *reactance.*

Inductive Reactance

If you connect an iron-cored electromagnet to a source of continuous DC, the impedance to the flow of the DC is the result of the ohmic resistance of the wire coil alone. That is, the resistance would be exactly the same if the wire were unwound from the coil and stretched out.

If the same electromagnet be connected to a source of AC having the same effective voltage, it will appear to have a much greater resistance than it had previously when operated on DC. Moreover, the apparent extra resistance will markedly decrease if the wire be unwound from the iron core and stretched out. This is the effect of the inductance of the electromagnet.

The iron core of the magnet coil reacts to the rapid fluctuations of the AC to generate a "counterelectromotive force"—a reverse current—which opposes the flow of the energizing current. The added impedance of this magnetic effect is called "inductive reactance" (X_L). It must be added (by a geometric formula to be given anon) to the ohmic resistance (R) of the coil to obtain the total impedance (Z) in ohms.

To complicate matters further, the inductive reactance of the electromagnet changes with the frequency of the AC, becoming greater with increasing frequency! (*Inductance,* itself, is constant, and is given in "henries." It is the *inductive reactance* in ohms that changes with the frequency of the current.*)

Capacitative Reactance

The capacitance of condensers (capacitors) gives rise to the third type of impedance in AC circuits—"capacitative reactance" (X_C). Direct current cannot flow through a capacitor (except momentarily when turned on or off). The separated plates of the capacitor interpose a break in the circuit. But the pulsations of AC pass through much as the fluctuations in air pressure can pass through a flexible air-tight membrane.

Capacitative reactance must be added to ohmic resistance geometrically, and to inductive reactance algebraically, to obtain the total impedance in an AC circuit. And like inductive reactance, capacitative reactance, expressed in ohms, does not remain constant (as does the *capacitance,* itself, expressed in microfarads), but increases with the frequency.*

Unlike simple ohmic resistance, both inductive and capacitative reactances affect the *phase relationship* of the voltage and current of the AC pulsations.

"Wattless" Current

We have already mentioned that we cannot determine the number of watts of power consumed in an AC circuit by multiplying the voltage by the amperes, as we do with DC. The effect of reactance is to blame for this strange state of affairs.

Inductive reactances oppose the flow of current and cause the pulsations of current (amperes) to *lag behind* the pulsations of voltage. If the inductive reactance of a device is sufficiently large, and the ohmic resistance sufficiently small, the current will lag behind the voltage nearly 90 electrical degrees! We then have "wattless current"—current having voltage and amperage, but no watts of power!

This happens in the highly inductive primary coils of transformers at times when no power is being taken from the secondary coils. The fluctuating magnetization of the iron core generates a counterelectromotive force which returns the power back to the source instead of

*Inductive reactance may be computed from the value of the inductance (henries), and capacitative reactance from the value of the capacitance (microfarads), by special formulas which include the frequency of the current.

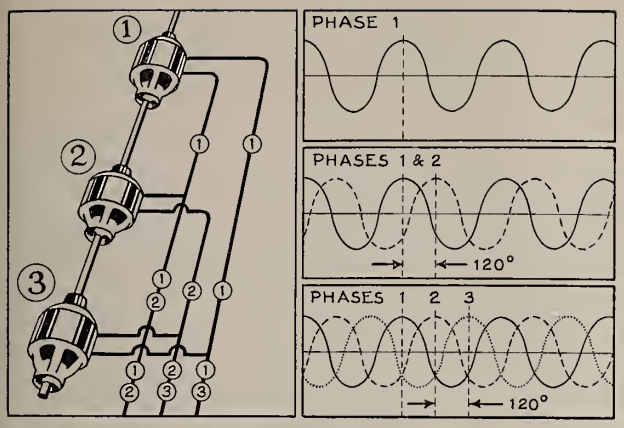


FIG. 4 — Three single-phase alternators (AC generators) connected to produce 3-phase current. Note how the six wires (three separate circuits) are connected to transmit the 3-phase current by means of three wires.

The alternators must be fixed to the same drive shaft for absolute synchronism, and their rotors must be displaced from each other by 120 electrical degrees for correct phase relationship. In practice, however, power companies employ 3-phase alternators.

consuming it. The flowing electricity is practically wattless. The voltage and current may be individually very great, but they are separated in phase to such an extent that their available power is negligible. In such a case, the current is said to have a power factor of nearly 0.

This is the reason why the primary windings of doorbell transformers are left connected to the power line at all times. No current is taken from the line and consumed until someone rings the doorbell, shifting the phase of the wattless current surging back and forth through the primary winding.

Capacitative reactances hold back the electromotive force as they build up a voltage charge, and hence allow the pulsations of current (amperes) to *lead* the voltage. It is possible to obtain wattless current in a capacitative circuit, too; but in this case the current leads the voltage by nearly 90 degrees. Capacitor-start single-phase induction motors make use of this phase-shifting property of capacitors to obtain 2-phase current for starting the motor and bringing its rotor up to speed for straight induction running.

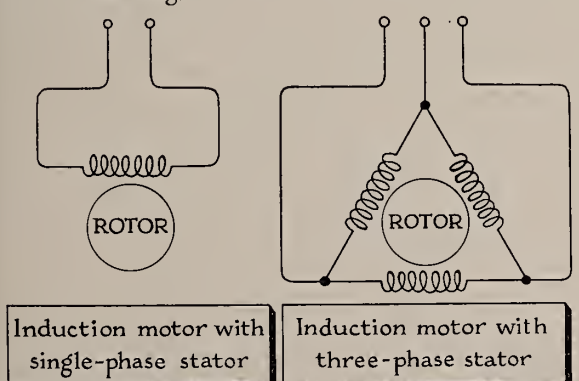


FIG. 5 — Single-phase and 3-phase induction motors. The single-phase motor will not run unless provision is made to start the rotor turning and bring it up to operating speed. This is because the magnetic field of the single-phase stator merely fluctuates in step with the alternations of the current. The 3-phase motor starts itself because the revolving magnetic field of the 3-phase stator drags the rotor around with it.

The various means employed for "splitting the phase" to start single-phase AC motors are described in Chapter 18 of "Mitchell's Manual of Practical Projection," which may be ordered from IP at 1645 Hennepin Ave., Minneapolis 3, Minnesota. The repair and maintenance of all types of motors are also thoroughly covered in the book.

Watt Formula Doesn't Work with AC

Wattless (or nearly wattless) current is interesting and in some respects important in the functioning of AC electrical apparatus, but it also represents a waste to the utility companies. No one pays for wattless current because it does not register on the consumer's meter and increase his electricity bill. It merely surges in and out of the line without accomplishing useful work. It cannot even light an ordinary household lamp-bulb even though its voltage may be a full 120.

We saw that electric power (watts, represented by P) is the product of volts (E) times amperes (I) in direct-current electricity.

$$P = EI.$$

In alternating-current electricity, however, the product of volts multiplied by amperes is called "volt-amperes," and only rarely equals the actual number of watts available or consumed. For this reason, certain AC apparatus is rated in volt-amperes or kilovolt-amperes instead of in watts or kilowatts. The formula $P = EI$ holds good in AC *only when the current and voltage are exactly in phase*—which is almost practically never.

Total Impedance in AC Circuits

Inductive reactance (X_L) and capacitative reactance (X_C) may be substituted for ohmic resistance (R) in the Ohm's law formulas previously given. When we have both kinds of reactance in an AC circuit, and because the phase shift produced by one kind opposes that produced by the other, the *net reactance* (X) is the algebraic difference of capacitative reactance subtracted from inductive reactance.

$$X = X_L - X_C.$$

Now, inasmuch as reactance changes with the frequency of the current, a circuit composed of inductive and capacitative reactances in series is strongly *resonant* at one particular frequency, passing this frequency very freely and supressing all other frequencies. Radio tuners, TV sweep oscillators, and certain electric organ tone generators make use of resonant circuits.

The problem becomes complicated when an AC circuit contains simple ohmic resistance as well as reactance —and this is nearly always the case. Ohmic resistance remains constant with changes of frequency, and does not affect the phase relationship between current and voltage. The value of simple resistances (ohms) cannot, therefore, be added arithmetically to the values of inductive and capacitative reactances (also in ohms *at a particular frequency*). These impedances must be combined by a formula based upon the geometric solution of problems involving reactances in AC circuits.

If X is net reactance, and R is ohmic resistance, the total impedance (Z) in the AC circuit is given by:

$$Z = \sqrt{R^2 + X^2}.$$

This formula directs us to add the squares of ohmic resistance and net reactance, and then extract the square root of the sum. (The square of a number is found by multiplying the number by itself, but a slide rule or table of roots is needed if the extraction of square roots by laborious computation is to be avoided.)

Having found the value of Z (total impedance), we may substitute Z for R in the Ohm's law formulas to calculate current and voltage in AC circuits.

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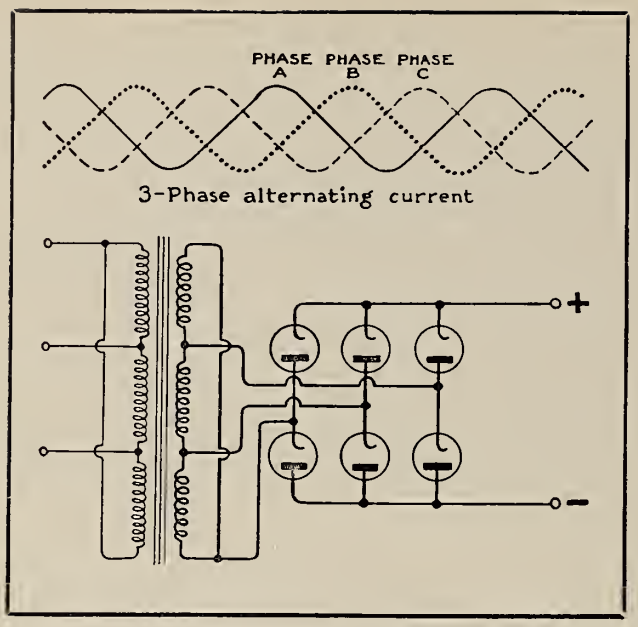


FIG. 6 — An arclamp rectifier having a "delta-connected" 3-phase input transformer. Although different in appearance, this hook-up is really the same as that shown in Fig. 5 for the 3-phase induction-motor stator.

How Transformers Work

A single-phase AC circuit is outwardly very much like a simple DC circuit, except that the AC circuit may include transformers, certain types of motors, and other components which won't work on direct current.

A transformer works by virtue of the rapidly fluctuating magnetic field developed by the rapid alternations of the current flowing through the primary winding. The fluctuating magnetic field *induces* currents in a separate coil of wire on the same iron core, the secondary winding. The voltage generated in the secondary will be lower than that supplied to the primary if the secondary has fewer turns of wire than the primary. Conversely, the voltage will be higher if the secondary has more turns of wire than the primary. We thus have "step-down" and "step-up" transformers.

At all events, a simple single-phase AC circuit can be traced from one terminal of the power supply back to the other without too much difficulty. It is a different story with 3-phase AC circuits! And yet the projectionist is almost certain to have one or more 220-volt 3-phase circuits under his jurisdiction.

Superiority of 3-Phase AC

Three wires are needed to conduct 3-phase current. If the 3-phase line is said to have a pressure of 220 volts, and if the phases are correctly balanced, an AC voltmeter will show that 220 volts are developed *across any two of the three conductors*. There are thus three possible connections for obtaining 220 volts of single-phase AC from the 220-volt 3-phase line.

As a matter of fact, electric power is nearly always generated by the power companies by means of 3-phase alternators; and the single-phase low-voltage AC used in the home is obtained ultimately from step-down transformers connected to the 3-phase high-voltage lines which transmit the power from the distant powerhouse. When designing AC distribution systems, line engineers have to exercise great skill so as not to "unbalance" the power company's 3-phase transmission lines.

The fluctuations of alternating current flowing in each of the three circuits of a 3-phase line are interdependent. That is, if something goes wrong with one phase, the bad effects will also be apparent in the remaining two, and apparatus powered by the 3-phase line will not work well.

The three currents have the same frequency and voltage, but differ in phase from each other by a third of a cycle—120 electrical degrees. This must not be confused with current-voltage phase differences, for even though such phase differences may exist in each of the separate phases of 3-phase current, we are dealing here with three alternating currents, the current-voltage pulsations of which have purposely been given a phasing difference of 120 degrees.

The superiority of 3-phase power for transmission and special uses is summarized by the following:

1. Three-phase transmission is more economical than single-phase.
2. Three-phase equipment is less complicated than single-phase.
3. The power fluctuates between narrower limits in a 3-phase circuit.
1. The power is $\sqrt{3}$ or 1.732 times greater than in a single-phase circuit carrying the same line voltage and current.

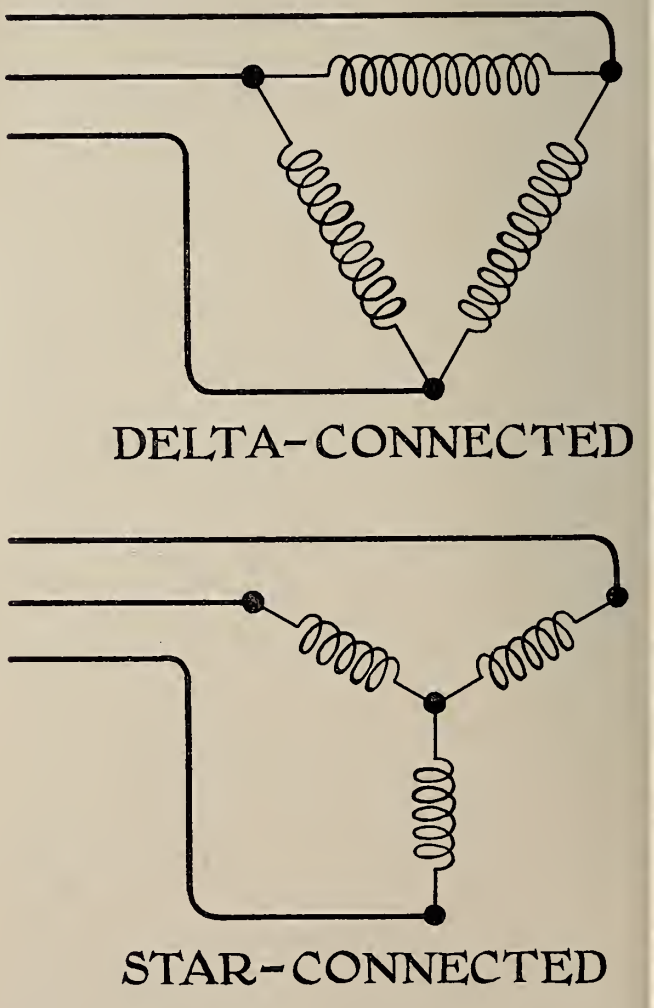


FIG. 7 — "Delta" and "star" connections for 3-phase transformer windings. The star hook-up has the advantage of less than full line voltage across each of the three coils. The common center of the coils (center of the "star") is sometimes grounded.

5. Self-starting 3-phase synchronous and induction motors are simpler, less prone to trouble, and less expensive than single-phase motors of equal power.
6. Three phase rectifiers give a smoother DC output with less "filtering" needed than single-phase rectifiers.

"Delta" and "Star" 3-Phase Hook-Ups

An induction motor having a stator wound for 3-phase current starts itself because 3-phase current produces a rotating magnetic field which drags the rotor around with it. A single-phase motor requires a "phase-splitting" arrangement, such as a special starting winding in series with a large inductance or capacitance and a centrifugal cut-out switch to disconnect the starting winding when the motor approaches operating speed. Because the magnetic field of a single-phase stator merely pulsates in step with the alternations of the current, such a motor is unable to start itself without a special starting arrangement.

Fig. 5 shows a "delta-connected" 3-phase stator winding for an induction motor of the type used in arclamp motor-generator sets. Instead of producing a stationary pulsating magnetic field, as single-phase current does, the 3-phase current produces a rotating field which both starts the motor and keeps it running. The self-connected armature and the absence of brushes, slip-rings, etc., make this type of motor beautifully simple and trouble-free.

Though the resemblance between the delta-connected motor stator in Fig. 5 and the delta-connected rectifier transformer primary in Fig. 6 may not be apparent at first glance, the similarity can be appreciated by tracing these two 3-phase circuits.

In this type of hook-up, the *ends* of the three coils (one coil for each phase) are connected together to form, in Figs. 5 and 7, a design which resembles the Greek letter delta.

Another way of connecting transformer windings to a 3-phase line (diagrammed in Fig. 7) is the "star" type of connection. One lead from each of the three coils is connected to a common electrical center, which may or may not be grounded.

In general, we do not ground any of the three wires of a 3-phase circuit, but let the power-company engineers attend to this detail according to their accustomed practice. Single-phase circuits, on the other hand, nearly always have one side connected to a ground-stake or water pipe.

This does not mean that the outer metal cabinet of a 3-phase rectifier or the frame of a 3-phase motor should not be grounded. Indeed, they ought to be for safety's sake; and electrical codes usually require it. A grounded cabinet or motor-generator frame, normally electrically neutral, will not pose so great a hazard to life should it ever become "alive" by accidental contact with a conductor of high-voltage 3-phase current. **iP**

Norelco Demonstrates Shutterless Projector Using Pulsed Lamp

OSSINING, N.Y. — North American Philips Co.'s Norelco discharge lamp projector was introduced here this month at the opening of Skouras Theatres' refurbished Victoria Theatre.

Niels Tuxen, manager of the communications and electronics division of Norelco, said the new projector fulfilled "a long-time dream of cinema technicians." The shutterless projector, developed by Philips and now used in many European countries and other parts of the world, produces light only while required by actual projections, thus, according to Tuxen, making the old light-devouring shutter superfluous and producing a flickerless image even at high screen brilliance.

Mr. Tuxen said that, unlike the traditional carbon-arc lamp projector used in American theatres until now, the new FP 20 S pulsed discharge lamp projector has constant light output regardless of the number of hours of operation. The heart of the projector is the SPP 800 pulsed discharge lamp, a small, slender quartz tube 3⅛ inches long and 7/32 of an inch in diameter at its thickest point. Mr. Tuxen explained that discharge took place inside a thin capillary tube, the luminous part of which had a length of about 11/16 of an inch, or 17mm. The lamp is operated by a pulsating direct current of 72 pulses per second or three pulses per frame, each with a duration of between two and three milliseconds. Light is produced only during these current pulses; in the interval the lamp is dark.

Mr. Tuxen said that the luminous efficiency remained practically constant throughout the life of the lamp and that the high brilliancy during the pulse peaks reached ten times its mean value, insuring uniform special energy distribution and excellent rendering of color.

He added that the film was exposed to less heating, ultra-violet radiation eliminated by an absorption filter contained in the lamp holder.

The projector is equipped with a turret fitted with two lamps. Normally, only the lower lamp is in operation. Mr. Tuxen said that if this lamp burned out, the turret pivoted automatically and the upper lamp took its place with only a split second delay. He said a lamp could be replaced and the turret turned up again during the performance, reestablishing the automatic standby for the lamp. **iP**



Mr. National Carbon has been appointed to represent the carbon and graphite manufacturer in its many contacts with the projectionist—here he is portrayed carrying a brief-case crammed full of helpful information on the wide range of industrial carbon and graphite products marketed by the company. Emblazoned on the case is the familiar N-in-Shield trade mark of National Carbon Co.

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New York Theatres Offer Novel Solution for Continuous Seating

NEW YORK — "Boccaccio '70" had its American premiere June 26th at Cinema I—Cinema II. Donald S. Rugoff, President of Rugoff Theatres stated about the Embassy picture:

"We are very pleased that our first program at Cinema I-Cinema II will be 'Boccaccio '70'. We look forward to creating with this attraction a new pattern of exhibition, with the two theatres in one building offering patrons the opportunity to see the feature from its start every hour on the hour. We feel it is our good fortune to have secured a film of such quality for our initial offering. The marriage of the film and the new exhibition policy should make for real excitement in the history of movie theatres."

A number of other new concepts in the housing of motion picture entertainment will also be incorporated in Cinema I-Cinema II.

Their joint entrances will be under a protective arcade on Third Avenue, leading in to separate ticket desks (in place of standard box offices), lounges and audience areas.

The lounges and lobby areas will incorporate a permanent, and periodically changing, exhibit of paintings by contemporary American artists in part of the waiting space; in another part, hi-fi equipment will be available for the playing of the latest stereophonic recordings; books will be on display, selected to illustrate various themes, perhaps tied in with the picture being shown, or reflecting some current trend in literature. In a word, the twin theatres will be the setting for a total entertainment or cultural experience.

New Theatre Core

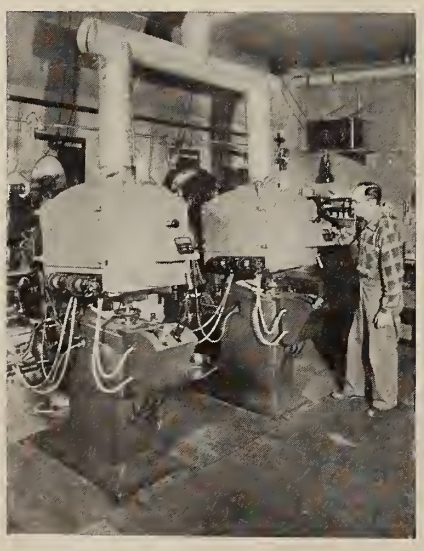
Rugoff feels that the two all-new theatres (the first to be built from the ground up since the early thirties), situated directly opposite Bloomingdale's, will serve as the core of an East Side International Film Center, that will become as distinctive a section of Manhattan as the Broadway legitimate theatre district or the 57th Street art galleries.

The new building was designed by Abraham Geller, the noted architect who was one of the finalists in the F. D. R. Memorial competition. Special consultant on theatre design is Ben Schlanger, (See IP, Jan. 62, page 8) one of the architects of Lincoln Center and the country's foremost designer of motion picture theatres.

The inside of the Cinema I-Cinema II auditoriums themselves will also include many features designed to enhance enjoyment of the film. Unusually roomy leg space (40 inches) will be accompanied by the fact that the "continental" type of design of the larger house will have all patrons arriving and leaving by side aisles. This will give all seats perfect sight lines, uncrossed by those who may come in or go out.

Special Lighting

Special lighting arrangements have also been devised by Schlanger and his lighting experts. All lights in the auditoriums will be synchronized with the projection equipment. When the film goes on, all extraneous lights within the theatres will dim at the same time, to create minimum diversion of attention. Patrons' eyes will automatically focus on the screen, with no other lights to distract them. The screens themselves will be what is called wall-to-wall — unframed and so designed that the entire end wall of the theatre is the screen. **iP**



INCREASED projectionist convenience and customer acceptance resulted from the installation shown above —new Constellation Special projection arc lamps by Strong Electric Corp., at the Kensington Theatre, Buffalo, N. Y.

from page 3

—if they do their part in learning the operation of new equipment and do the best possible job in presenting the films.

So the projectionists should be assured that others are helping fight their fight, and give them the total support that all segments of the industry must render to each other.

Also carefully to be considered by the delegates according to the current 1A Bulletin, is the matter of "reseeding the field" with competent young craftsmen of every sort to replace those who are getting along in years.

The delegates also will receive a report on a pension-plan study which the general office has made in response to a request by the 1960 convention. At that time, it was pointed out that retiring members of most large IA locals now are covered by pensions—and that the next step is to seek to devise a way to extend coverage to the members of smaller locals as well.

Of major concern at the Las Vegas gathering will be business developments which have hampered employment in the motion picture industry. Under careful study will be the question of film production in this country and abroad and what can be done to stimulate the job opportunities of our studio members.

Many well-informed observers are convinced that the time has come for the U. S. Department of Justice to review the effects of the 13-year-old consent decree in the Motion Picture Industry Anti-Trust Suit—and that possibly the industry's workers might succeed, where the employers have failed, in bringing this about. Conditions now are vastly different than in 1949. Divesting the producers of their theatres, which needed year-round programming, has prompted them to concentrate on fewer and bigger pictures.

Prohibiting the sale of films in blocks has had a similar influence. This has worked to the detriment of projectionists and other 1A personnel both in Hollywood and in production booths throughout the U. S. and Canada, for product shortage has been a big factor in theatre closings. Another factor, of course, has been the shifting of populations — the urban sprawl—which has hurt business at many a downtown house but has stimulated somewhat the building of new suburban theatres. Here, too, however, the consent decree has been damaging, for the companies which took over the circuits from the producers now have to get permission from the Department of Justice and the U. S. District Court before they can acquire a single new unit. This always means many months of waiting, and often the answer is "No."

The agenda at Las Vegas also includes a review of collective bargaining developments throughout the past two years. Special attention will be paid to contracts with the many theatres showing Cinerama pictures for the first time. IP

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Inventive Projectionist Comes Up with Workable 3-D from One Lens, One Film

NEW CASTLE, IND.—Projectionist La Fayette E. Thomas has invented a 3-D lens. It is not a freak — no one leaps out at you. Only one camera or projector is needed. And you don't have to wear polarized glasses to get the effect.

Lafayette Thomas is projectionist at the Sky-Drome Drive-In Theater during the summer. He is also the Pictorial Co., manufacturing to order 8, 16 and 35 mm anamorphic lenses for Cinemascope-type pictures for cameras and projectors.

He has no local customers, but he gets orders from places as far away as California, Washington, New York and Alabama in the United States and Cuba, Hong Kong, Australia, Saipan, France, Italy and Portugese West Africa.

Thomas, who is a direct descendant of Le Marquis de LaFayette and carries the family crest on his business stationery, has been a projectionist most of his life. He had tinkered with lenses and cameras for more than 30 years.

"I have a blue billion ideas," he said. "I work on one until I get stalemated. Then I work on something else and finally go back to the first thing with a fresh approach."

Lafayette Thomas is being very careful with his latest invention in stereo vision. He keeps the drawings and lens in the safe deposit vault of a New Castle bank. He doesn't trust Washington patent attorneys, and with good reason, according to his story. In 1948, he attempted to have patented a noiseless movie camera. But he claims the lawyer stole his ideas and had them patented under the name of someone in the law office.

Some years ago he went to Hollywood to attempt to sell an idea on a camera. But he divulged too much. The person to whom he spoke later took out a patent on the same idea.

After these hard lessons Thomas is keeping his latest invention behind bolted doors. He has a producer interested in using the lens in the production of a picture. But Thomas says he will be right there during the filming. He wants no "accidental" breakage so that someone else could find out how he has constructed his lens. It only can be leased, not sold.

In developing his lens, Lafayette Thomas took his cue from the human eye. He says that when we look at an object, we get the vision of depth because our eyes glance. If we stare fixedly, the same object will appear flat.

His lens does not glance, of course, but it is constructed to see about 10 degrees around an object to produce an illusion of depth. To achieve this, it has 12 different kinds of elements.

Thomas has taken about 300 feet of film with his lens mounted on a movie camera.

The Montana Rockies show great height and depth. And a Pennsylvania train, roaring down the track is a thriller. (Thomas said the train sucked off his hat and he had to brace himself to keep from being drawn under the train.)

Like pictures taken with a wide angle lens, practically everything is in focus. Thomas says the lens works best on a convex screen, but has never been projected on a large convex screen.

He has tried out a small one, though, and he says the illusion of depth is even more convincing.

The picture is photographed on a single film, and no special lens is used on projection equipment. **iP**

Closed-Circuit TV Draws More Experimenters

NEW YORK — If Dynamic Theatre Networks, Inc., goes through with its present plans, by the end of 1962 there will be 20 theatres in as many cities showing one performance a week of Broadway stage plays via closed-circuit television.

The Dynamic company in March had an experimental four-day, five performance of "Gideon" from the stage of Broadway's Plymouth Theatre to the Auditorium Theatre in Rochester, N. Y., which drew 5,200 persons, to a gross of $9,533, for the five performances. It was less than a financial success, but Dynamic executives were pleased with the results, though Theatre Network Television, Inc., which conducted the telecasts, wasn't pleased because it lost money on the deal, according to its president, Nathan L. Halpern.

Reaction to the Rochester experiment was enthusiastic to hostile. Some people in the field said it would revolutionize the entertainment business; Hollywood film producers darkly viewed the competition to their attractions; to exhibitors with showcase theatres in large cities it was old-hat, because they had experience with closed-tv, having presented prize fights in the past. Some exhibitors said it posed a threat to home toll-tv, and stage actors and Broadway producers were delighted at the prospects of the pot of gold that Theatrevision could bring to them.

People in the Rochester trading area paid from $1.50 to $3 to see Paddy Chayefsky's drama on a 20 by 15 foot screen in black and white, projected from the Auditorium Theatre's orchestra pit.

Dynamic Theatre Networks, a division of Dynamic Films which produces non-theatrical films, is said to have its own color projection process, developed by the Marconi Company of England.

About 11 years ago theatre color television was demonstrated in this country, by RCA and the Eidophor demonstration in the Little Theatre of 20th-Fox home office in New York. The Eidophor, developed in Switzerland, had an up-to-date dem-

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onstration last year in Europe, and was described in IP in May 1961.

Eidophor is based on the Schlieren optical system and employs a xenon lamp to project upon the screen the so-called "moving lantern slide," which the optical system forms on a layer of oil 0.1 in thickness, coated upon a concave mirror. The cathode-ray tube forms the tv image on the layer of oil by a varying degree of light refraction, from different parts of the image, disturbs or deforms the oil surface. **iP**

Century Sound Techniques Surveyed By European Expert

NEW YORK — William A. Mueller, veteran Hollywood sound director who recently completed a two year tour as sound and motion picture consultant to the Indonesian government, arrived here to survey the latest American sound techniques and equipment as consultant for M.C.S. Films in Munich, Germany.

He reported that the 70 mm film productions with six-channel stereophonic sound are very popular and profitable in Germany, and exhibitors there are clamoring for this product.

Mueller is the former sound director for Warner Bros. studio, where he won several Academy Awards. His services were supplied to the Indonesian government by the U. S. State Department.

He stated on his visit here that he was tremendously impressed with the new Century transistor sound system and especially with the multiple channel models. Mueller declared that he considers these systems to be among the "greatest advancements in sound reproducing equipment" that he has seen to date. **iP**

New Standard Defines Motion Picture Theatre Screen Luminance

Luminance of all screens for indoor motion picture theaters is specified in a new American Standard approved and published by the American Standards Assn.

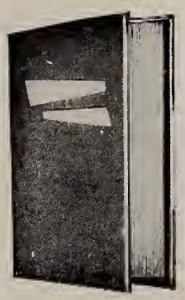
Developed by the 30-member PH22 sectional committee set up under ASA procedures and with the Society of Motion Picture and Television Engineers as administrative sponsor, the standard provides for luminance distribution on matte as well as directional screens.

"American Standard Screen luminance for Indoor Theaters, PH22.124-1961" provides for the measuring of luminance with the projector, either 16 or 35mm, in operation, but with no film in the gate. Screen luminance is measured on the horizontal axis, excluding marginal portions five per cent of the screen width from the edge. A photometer having the spectral sensitivity of a standard observer, specified in 1931 by the International Commission on Illumination, must be used in measuring screen luminance.

According to the standard, luminance should measure between 25 and 65 nits, a nit being one candle of light per square meter.

Copies of the American Standard are available at $.50 each from the American Standards Assn., Dept. P263, 10 E. 40th St., New York 16, N. Y. **iP**

How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise — how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

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Data Communications Consultant, Bell Telephone Laboratories, Inc.

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In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
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Inventive Lou Walters Nears 52 Years In Theatre Business

Lou Walters, practicing projectionist, inventor and technical expert, is nearing his 52nd year in the theatre business, culminating in a Gold Card from St. Louis Local No. 143 and still working at the job he loves best.

He got his Gold Card after 40 years of organization—and he also has his membership in Local No. 249 in Dallas, Texas, where his motion picture repair shop is busy with repair work and new engineering development from throughout the U. S.

And he still works five nights a week at the Bruton Road Drive-in at Dallas.

"Distance is no factor any more," he says, with the fast motor truck delivery; and since many of the supply houses have been forced to discontinue their shops because of the spasmodic flow of repair work, my facilities have come in handy and save the supply houses the shop overhead."

In addition to the repair service, Walters also manufactures a carbon saver for rotating type lamphouses and, in 1957, with the advent of narrow-hole film he worked out a system for regrinding sprockets which resulted in several dollars savings for each booth employing his services.

Walters' first movie job was as all-around flunky, working evenings after school in the Tent Nickelodeon —that was in 1911. In 1914 he went to work as a rewind boy at the Liberty Theatre, St. Louis, served his apprenticeship with the projectionists' union, and became assistant operator at the Gravois Theatre.



Lou Walters

Later he spent 10 years in the employ of the Lears theatre supply firm, operated the Isis Opera House, Paragould, Ark.; returned to Missouri and joined the St. Louis Theatre Equipment Co., agents for the Nicholas power projector. Other industry connections were with Exhibitors Supply Co. when it was formed, marking the beginning of National Theatre Supply Co., which he served as salesman in St. Louis and branch manager in Cleveland.

Walters was with Cine Supply in St. Louis 1944-48 when he sold his interest and became district manager for Ampro Co., headquartering in Dallas and covering five states for its 16mm projector.

Becoming tired of being on the road, he returned to projection with the largest Dallas drive-in in 1949 and opened his repair shop. iP

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MODERNIZATION

NEW YORK — Modernization of theatres will be the theme of the forthcoming conventions of Allied States Association of Motion Picture Exhibitors, Theatre Equipment and Supply Manufacturers Assn. and Theatre Equipment Dealers Assn.

The Motion Picture Industry's 1962 Trade Show, jointly sponsored by Allied, TESMA and TEDA, will be held concurrently with the three conventions, Dec. 3-5 at the Sheraton-Cleveland Hotel. iP

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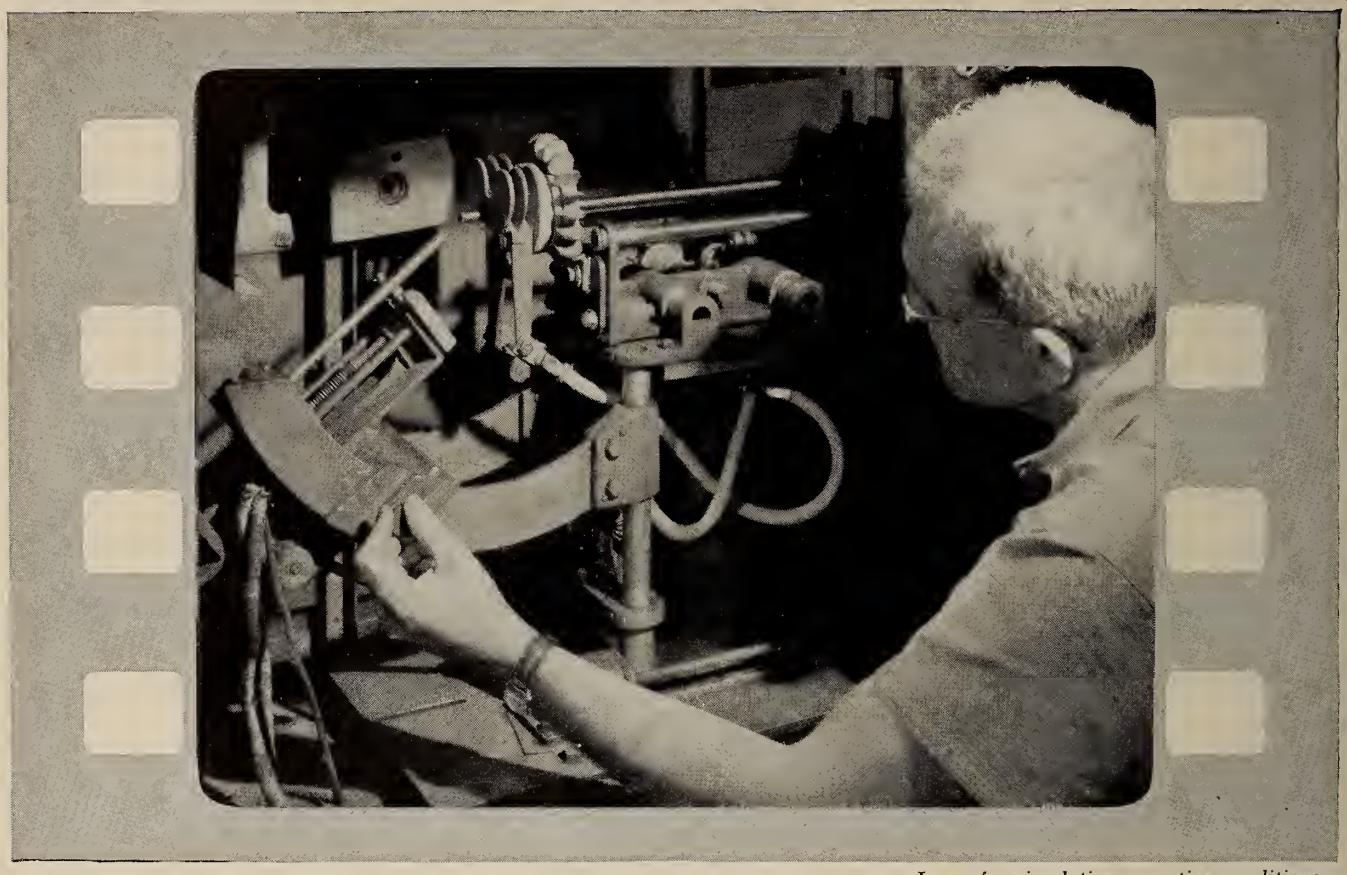
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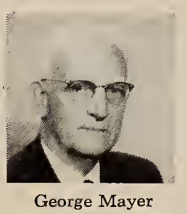
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Volume 37 August, 1962 No. 8

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

CINERAMA IS COMING YOUR WAY

The saying these days that the "attic inventors" are through because the modern inventions stem from the research laboratories of big corporations, are not convincing to the majority of the craftsmen in the projection trade.

They look at Lee DeForest who made the movies talk by his invention of the audio tube; Herbert Kalmus whose long persistence developing the Technicolor process; to Fred Waller's Cinerama which made history in 1952 and again in 1962 (with the association by Metro-Goldwyn-Mayer and the Cinerama company with the first dramatic story, "The "Wonderful World of the Brothers Grimm"); to Mike Todd's vision which resulted in the Todd-AO process, and the booth craftsmen whose practical advice made many new inventions work by counseling the technical men of the big companies which resulted in getting the bugs out of new theatre machines.

Many a booth man has contributed to the refinements of new theatre equipment. It is also true that scientists and engineers, cameramen and heads of studio technical departments and their staffs have contributed much to the film theatre's new inventions.

You have only to take the case of the refinements to Cinerama during the ten years since it was publicly shown.

On Saturday, July 14, the Cooper Cinerama Theatre in Denver put on the world premiere of the "Wonderful World of the Brothers Grimm," the MGM production directed by George Pal with live actors and animation in a dramatic story. The Cinerama pictures heretofore were travel scenes with no story line, depending on exotic locales, and thrills like the ride on the roller coaster in the first Cinerama picture.

The audience saw the same participation as noted in the first Cinerama pictures, but this was a different theatre experience, as it had a dramatic story, improved sound, virtual elimination of the lines separating the three panels, and improved color consistency.

These technical matters show the successful refinements by Douglas Shearer, head of MGM research; Tom Conroy, vice president in charge of Cinerama production, and John Caron, head of Cinerama research and engineering, plus better laboratory techniques.

The difference in color (due to uniform prints), the difference in light intensity between the three panels, the unsteadiness between the panels have virtually been eliminated in the process.

The so-called "gigolo device" makes less noticeable the impinging of the films where they join at the three panels. The giggling gears of reciprocating teeth in the machine cut down light intensity. There is an overlapping of the panels in Cinerama projection, or a duplicate image of .051-in. on the positive print. When projected, and vignetted by the gigolo device, this duplicate image is approximately 12 inches wide on the screen, meaning the two projectors are casting light on the screen so there would be double the light where the prints overlap at the panels as on other parts of the screen surface. The giggling gears of the reciprocating teeth in the machine cuts down the light intensity.

The "surround" feature of the Cinerama picture in

(Continued on page 15)

INTERNATIONAL PROJECTIONIST

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306, RKO-Loew's 6-year Agreement adds 5% to Funds This Year; 5% Wage Rise in 5 Years

NEW YORK—IATSE Local 306 has concluded a six-year agreement with RKO Theatres and Loew's Theatres in New York City.

The agreement provides an increase to the Pension Fund and Welfare Fund from 10% to 15% on Sept. 1, 1962; the third year paid vacations will increase from two weeks to three weeks, and the fifth year a 5% increase in wages.

Ernest Lang, secretary of 306, said the Pension Fund needed the increase because the Local has over 300 pensioners among its 1,401 members. "That," said Lang, "came first, even before an increase in wages and vacations." He said the Local on Sept. 1 will put 10% in the Pension Fund and 5% in the Welfare Fund.

The agreement also stipulates that if one of a five-man booth crew retires, the four remaining crew, with agreement among them, could split up the time and could work for 21 hours a week for $145, overtime at the rate of $9.75 per hour, instead of working 28 and a fraction hours a week for $127.50.

The former agreement expired on May 31, but there was a delay in getting together on the new pact. As a matter of fact the Local's membership voted that their negotiation committee had freedom to call a strike, and 306 committee turned it over to IATSE headquarters, and Richard Walsh, IATSE president, acted as the mediator and from then on was one of the negotiators for the new agreement.

The negotiation committee of 306 consisted of the three paid officers—Lang, Steve D'Inzillo and Harry Garfman, respectively business agents for New York and Brooklyn — and Dick Cancellare, president; Peter Capone, vice president; Abe Kessler, treasurer, and Isidore Schwartz, secretary.

Local 306 started its pension fund in April 25, 1951. Pensioners since that date draw $60 bi-weekly. As of October 31, 1961 some pensioners of the Local have drawn above $16,000.

The Welfare Fund provides members with Blue Cross hospital benefits in addition to other benefits, including a $4,000 death benefit.

The new agreement with RKO and Loew's theatres assures the Pension and Welfare fund of 306 in addition to an increase of three weeks vacation in three years and a 5% wage increase in five years.

Local 306 negotiation committee as of the end of July is bargaining with the ITOA and independent theatres in the city to wrap up an agreement. **iP**

Robert W. Porter To Metro-Kalvar Post

NEW YORK—Robert W. Porter, for the past year in charge of the western engineering division of the Kalvar Corporation, has been appointed vice president of engineering for Metro-Kalvar, Inc., a company jointly owned by Metro-Goldwyn-Mayer Inc. and Kalvar Corporation, it was announced by Joseph Vogel, president of Metro-Goldwyn-Mayer Inc., and Alfred J. Moran, president of Kalvar Corporation.

With headquarters at the Metro-Goldwyn-Mayer Studios, Porter immediately assumes his new executive position with Metro-Kalvar. The company has exclusive rights to market the revolutionary dry processing Kalvar film products for the entire motion picture and television industries. **iP**



W. J. Humphrey, IATSE local 316, has been a projectionist for 40 years. He recalls the days when he used to crank the old Edison projectors. He is shown here operating a Strong Trouper carbon arc follow spotlight at the Miami Theatre, Miami, Fla.



Ralph B. Day, IATSE Local 316, started in show business at quite an early age. In fact, having been taught by his father, he became a "pro" at the age of nine. He had a regular job in 1918, and has been with Wometco since 1934. He is shown here operating a Strong Trouper carbon arc follow spotlight at the Carib Theatre, Miami Beach, Fla.

W. F. TAIT NAMED

NEW YORK—The appointment of William F. Tait as division vice president for marketing of government services for RCA Service Co. has been announced. He will be responsible for all of the marketing activities of government services which plans, engineers, installs, maintains and operates electronic equipment. **iP**

Norelco "Shutterless" Projector with Pulsed Lamp Installed in Victoria Theatre, Ossining, N.Y.

NEW YORK—Norelco's "shutterless" projector has come to the U. S. Skouras Theatres Corp. has installed it at the circuit's remodeled Victoria Theatre at Ossining, N. Y., which re-opened July 16 with projection by Norelco's FP 20-S projectors which utilize the SPP 800 pulsed gas discharge lamp, developed by North American Philips in Eindhoven, Holland. (See July **iP**.)

The SPP 800 pulsed gas discharge lamp, which eliminates mechanical shutters, lamp houses, exhaust systems, rectifiers or generators, consists of a tiny quartz tube (3⅛" long and 7/32 in diameter at its thickest point.)

The lamp is operated by a pulsating direct current of 72 pulses per second, or 3 pulses per frame, each with a duration of between 2 and 3 milli-seconds, with light produced only during these current pulses. In the intervals the lamp is dark.

The compact light source is placed very close to the film aperture with the film exposed to less heating—ultra-violet radiation is eliminated by an absorption filter contained in the lamp holder—and under operating conditions the lamp is surrounded by a flow of cooling water which absorbs the infra-red.

The Norelco FP 20-S is equipped with a turret with two SPP 800 pulsed discharge lamps. Normally, the lower lamp is in operation, but if this lower lamp burns out, the turret pivots automatically and the upper lamp takes over with only a split second's delay. The burned out lamp can be replaced and the turret turned up again during the performance, thus re-establishing the automatic stand-by lamp.

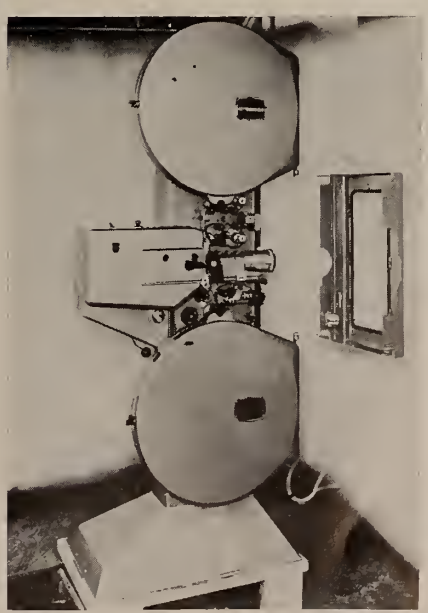
Neils Tuxen, general manager of Norelco's communications and electronics division, and Salah N. Hassanein, president of the Skouras circuit, headed a group of circuit and distribution executives, exhibitors and trade paper reporters for a demonstration to the "new" Victoria on the afternoon of July 16.

The demonstration included three flims projected by the shutterless Norelco projector. Two color and black and white of standard aspect, and a color film for CinemaScope. The Victoria flat screen is 25 feet wide, and the CinemaScope screen is 36 feet wide.

After the screen demonstration the group proceeded to the Victoria booth with Mr. Tuxen and Fred Pfeiff, technical manager for Norelco, explaining the details of the FP 20-S projectors and the SPP 800 pulsed discharge lamp.

Mr. Tuxen said that about 300 theatres in Europe had installed Norelco's FP 20-S projectors with the pulsed discharge lamp. He said the Norelco pulsed light source is capable for a standard screen up to 30 feet wide and 36-foot wide CinemaScope screen. He added that the pulsed light source is ideal for small theatres, especially art houses, and in situations where an arc lamp is impractical, including schools, ad agencies and museums. He said his company is planning to exhibit the shutterless projector at the TESMA-TEDA convention—Dec. 3-5 in Cleveland.

The Victoria Theatre is the 11th Skouras circuit house to undergo a major remodeling this year, according to Mr. Hassanein. The Victoria renovation project, except for its four outside walls, is new from screen to lobby door. Its capacity is 724 seats. The remodelling cost $100,000 and another $25,000 for new equipment, including a new sound system—and air conditioning plant.



Norelco's new FP 20-S shutterless projector, which uses the revolutionary SPP-800 pulsed gas discharge lamp. This view shows the film path door open and the projector equipped with both optical and magnetic sound heads and a CinemaScope lens.



The heart of the FP 20 S pulsed discharge lamp projector is the SPP 800 lamp and reflector.

The Victoria has a Technicote screen and a soft gold curtain that is controlled from the booth. The lenses on the Norelco projectors are B&L F-2 and Vidascope F-16. The sound system is Ampex with modification by Skouras Theatres sound department.

The projection room has Neumade film cabinets and rewinders, and is located ceiling-high above the small balcony.

The Victoria occupies a 60 by 125 ft. plot in the business section of Ossining, and its major remodelling was started in March of this year.

The architect was H. Tanenbaum of New York, and the decorator Neva Hassanein, wife of the Skouras Theatre's president, with Joe Hornstein, Inc., furnishing the equipment.

The lobby walls are treated in zebra-striped vinyl wallpaper, with walnut trim and a white marble tile floor.

The auditorium walls are of soft gold, with ceiling down-lights. The chairs (International Seat Co.) are upholstered in red, and the carpet in the auditorium aisles are red, black and gold.

The Victoria is operating on a policy of first run in Westchester County. **iP**

Duluth Theatre Opens With IA Agreement

DULUTH, MINN. — Benjamin Berger's Lyceum theatre has reopened here as a second-run house following the signing of a new agreement with the Projectionists' local 509, IATSE. **iP**

UNIQUE OPTICS OF THE PROJECTOR

by ROBERT A. MITCHELL

ASIDE FROM smoothly managed changeovers, good sound reproduced at the proper volume level, rock-steady images, and a complete absence of misframes and film breaks, the hallmarks of quality projection are sharply focused pictures and a bright, white, evenly illuminated screen. If the pictures are blurry and dim or discolored, the projection must be considered unsatisfactory no matter how good it may be in other respects.

Both the focus and the illumination of projected pictures involve the *integrated* optical functioning of the motion-picture projector. Assuming that the projection lens is of good quality and that the arclamp is in good condition and operated with the recommended trim of carbons burned close to maximum current rating, anything wrong with the clarity of the picture and its brightness must be blamed on damaged or dirty optical elements or on a faulty lineup of the optical components.

It is easy for persons not familiar with the projection process to blame the projectionist for defects in the picture While it is true that a competent projectionist can sometimes obtain acceptable screen results with "junk" equipment, certain lamp and projector defects absolutely preclude all possibility of good projection.

No one knows this better than the projectionist, himself. He knows what is wrong with his equipment, but he can rarely convince the exhibitor that various components of a projection installation wear out and have to be replaced from time to time.

Exhibitor Resistance to Booth Upkeep

Arclamp reflectors are a particularly sensitive bone of contention between projectionists and theatre managers these days. The owners of a small New England circuit force their projectionists to "make do" with reflectors that are so badly cracked that they are in danger of breaking. Still another circuit in the same area—one that includes large urban houses—maintains that the public is so accustomed to poor quality pictures on television that the use of badly tarnished arclamp mirrors, inferior lenses, and curved, aluminum screens marred by conspicuous seams makes no difference. Actually, projection quality makes all the difference in the world, coming second only to the content and dramatic worth of the feature picture, itself, as a factor influencing theatre attendance.

In no other business is the upkeep of the "plant" as sadly neglected as it is in the motion-picture exhibition business. Exhibitors yammer about poor theatre attendance, but continue to book unattractive films and project them with obsolete, wornout equipment. The public is now thoroughly weary of the repetitious, commercial-ridden pap presented poorly on TV, and would dearly love to attend movies, but is discouraged from doing so by the short-sightedness and penuriousness of theatre managements. All too many exhibitors refuse to give the public a break.

It should be obvious to everyone that all the light reaching the screen from the arc must be reflected by the lamp mirror, and that light which is not reflected contributes nothing to the brightness of the picture. *Of all the components in the optical train of a projector, the lamphouse mirror has the greatest effect upon the lighting, and hence upon the visibility, of the picture on the screen.*

There should never be any compromise in the quality and condition of the arclamp reflector. Reflectors are not expensive; but even if they were priced ten times higher, we should still give the same advice. A tarnished or badly pitted mirror cannot reflect light efficiently: a cracked mirror endangers the show: poor projection discourages theatre attendance.

(Please turn to page 8)

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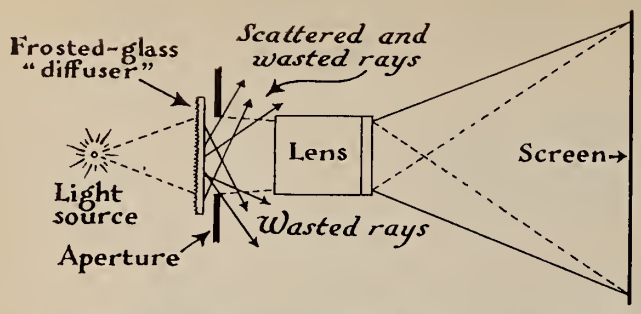


FIG. 1—"Diffuse" illumination is too wasteful of light to be used for motion-picture projection. The light rays scatter in all directions, hence only a small percentage of them are intercepted by the lens to be projected upon the screen. The lamp system of a theatre projector provides highly directional, or "specular," illumination for maximum efficiency.

Lamp-to-Lens Lineup Critical

Like any other optical apparatus, a motion-picture projector has an optical axis—a center-line which must intersect the exact centers of all the optical components. It is important to keep in mind that the optics of the lamp and projector are not independent, but *interdependent*, systems; and if the aperture-lens system of the mechanism is not in line with the arc-mirror system of the lamp, the screen illumination will suffer both in quality and in quantity.

The optical axis of a theatre projector must intersect the centers of the lamp reflector (*both* reflectors in the case of blown-arc, xenon, and incandescent lamps), the positive-carbon crater or other light source, the film aperture, and the projection lens. A perfect lineup of all these components may be accomplished by sighting or by the use of tightly stretched string or an aligning tool and dummy lens furnished by equipment dealers.

The lamp of a motion-picture machine must do more than just pour light on the frame of film over the aperture. It must also direct the light to the lens so it can be used to illuminate the projected picture on the screen. No matter how intensely illuminated the film may be, only those rays of light which pass through the lens as well as through the aperture succeed in reaching the screen.

To insure maximum pickup of light by the lens, the center-line of the bundle of rays emitted by the lamp must coincide exactly with the center-line of the lens. And, of course, the projection lens must be large enough to intercept and utilize nearly all of the light which pours lensward from the aperture. This is why "fast" lenses are to be preferred—oldstyle small-diameter lenses pick up only the central rays and allow the marginal rays to overshoot upon the lens barrel or holder casting where they are wasted.

Projector Optics 100% Specular

The optical functioning of a theatre projector is somewhat complicated by the *specular* character of the illumination and film-imaging systems. The light rays do not fan out in all directions indiscriminately after passing through the aperture, but maintain a high degree of parallelism. This strongly directional character of the rays vastly increases the efficiency of the illumination system and increases the apparent contrast of the projected image.

If the illumination system of a projector were "diffuse," as by placing the bare light source behind a sheet of frosted glass in back of the aperture, the rays would diverge in all directions and the lens would fail to intercept many of them. The resulting screen image would be very dim, and the picture would appear "soft" because of reduced contrast. Furthermore, focus would be somewhat more critical.

Photographers who use both specular and diffuse illumination for enlarging photographs know how very more efficient and contrasty specular illumination is. Diffuse illumination, furnished by a frosted lamp bulb behind ground glass, has only one optical advantage—it tends to "hide" scratches in the film or negative, whereas specular enlargers having condensing lenses tend to accentuate scratches. The "scratch-accentuation" of specular illumination is also present in theatre projection.

Aperture "Spot" an Image of Crater

The illumination system of a regular motion-picture projector places an enlarged image of the light source (carbon crater, xenon arc, or bulb filament) on the aperture. The image may be slightly out of focus, but this helps smooth out irregularities in the luminous distribution of the source and give a more uniform field of light on the screen. Nevertheless, the fact remains that the projected field of light is actually nothing but a rectangularly masked portion of the light-source image.

The "spot," or image of the light source on or close to the aperture plate of the projector mechanism, is an "aerial image"—light rays brought to a focus in midair without a screen to produce a visible image in the focal plane. Only the outer portions of this aerial image which fall upon the baffle plate surrounding the aperture are visible through the dark "spot glass" of the mechanism. The tail-flame of the arc is also sometimes visible on the baffle or cooling plate as a faint streak of light which extends downward. (The image formed by a concave mirror, like that formed by a convex lens, is upside down and reversed left to right.)

Aerial Image of Mirror

Because the twofold optical system of a projector is completely specular, another aerial image is formed by the projection lens in addition to the principal image of the aperture and film on the distant screen.

This secondary aerial image is an image of the lamp condenser (mirror or condensing lens as the case

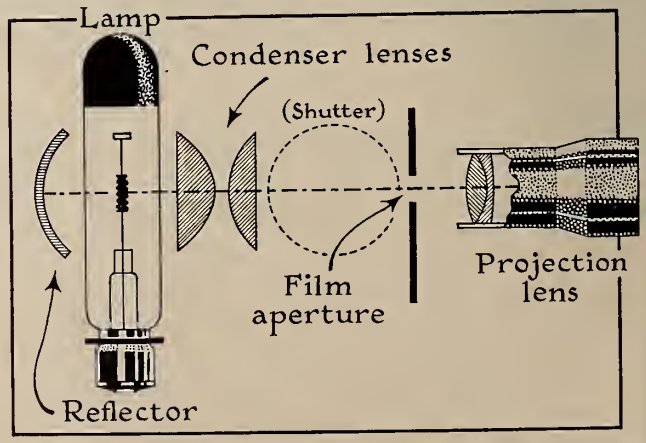


FIG. 2—Incandescent mazda lamps are used in most portable and narrow-gauge projectors. The condensing lenses perform the same function as the large mirror of a reflector arclamp: they collect the light rays from the source and focus them to form a slightly enlarged image of the source upon the film aperture.

may be), and is formed a short distance in front of the projection lens. This image is of little practical importance with rear-shutter mechanisms, but is an interesting manifestation of the complex ray geometry of a two-fold specular system. The only conceivable use of the aerial image is that a changeover shutter or dowser positioned in its plane will produce smooth fade-ins and fade-outs of the projected pictures when slowly opened or closed. Such a dowser placed at any other point in front of the lens will produce a moving shadow across the screen instead of a smooth fade effect.

A projector which utilizes diffuse illumination, such as an opaque projector, has no aerial image.

Although the motion-picture projector comprises two distinct, but interdependent, optical systems, there are three "object" and "image" planes. It will be noted that the projection lens is the imaging agent for two sets of planes.

IMAGING AGENT	OBJECT	IMAGE
Mirror:	Light source	Spot
Lens:	Mirror	Aerial image
Lens:	Film	Screen picture

The projection lens establishes two sets of conjugate foci, the important one being, of course, the film-screen set. The secondary one is the mirror-aerial image set. In forming an aerial image of the lamp mirror, the projection lens functions in reverse as a camera lens which "photographs" the distant "object" (the lamp mirror) as a small image suspended invisibly in mid-air only a few inches away.

If a 14-inch lamp mirror is used at a working distance of 35 inches from the film aperture, and the projection lens has an E.F. (equivalent focal length) of 4 inches, the aerial image is an image of the mirror 1.75 inches in diamenter 4.5 inches in front of the effective plane of the lens—the plane which the lens would occupy if it were a single-element lens of 4 inches focal length.

With lenses of other focal lengths, but with the same lamp setup, the aerial image has different diameters and distances from the lens. Thus a 3″ lens places a 1.3124″ diameter aerial image 3.2812″ from the effective lens plane, and a 6″ lens places a 2.625″ diameter aerial image 7.125″ from the effective plane. By interposing a sheet of black cardboard into the light beam in the plane of the aerial image, a clear image of the lamp mirror will be seen—center hole, positive-carbon holder, and all!

Mathematical Analysis

The optical geometery of the aerial image appears to be better understood in Europe than in America. Because several engineers have requested mathematical analysis of this image, we hasten to inform them that the properties of the aerial image are completely and perfectly set forth by the well-known formula for the conjugate foci of an image-forming element, namely,

$$d'' = \frac{d' f}{d' - f}$$

in which d′ and d″ are the two focal distances, and f is the focal length of the lens. To compute the distance of the aerial image in front of the effective plane of the lens, the depth of the center of the lamp mirror below its edges (y) is subtracted from the working

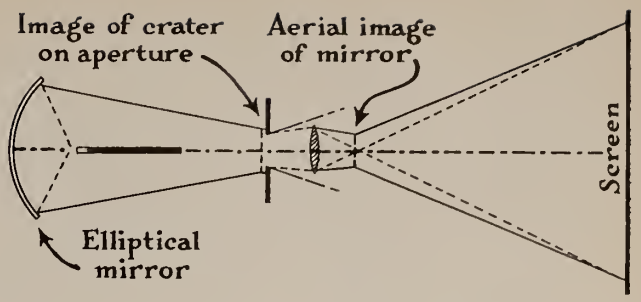


FIG. 3—The lens of a projector "sees" the lamp mirror or condensing lens through the aperture and forms a small image of it—the aerial image—a few inches away. If the aerial image is smaller than the open clear diameter of the lens, there will be a constriction of the beam where the aerial image is formed. This is possible because, in the double specular optical system of a projector, each point of the aperture area is imaged on the screen, not by the entire area of the lens, but by only a fraction of it.

distance (w), to which difference the focal length of the lens is added:

$$d = \frac{f\,([w - y] + f)}{([w - y] + f) - f}$$

which reduces to:

$$d = \frac{f\,([w - y] + f)}{w - y}$$

The diameter of the aerial image is found by the proportion (w-y) + f : m :: d : a, in which m and a are the diameters of the mirror and the aerial image, respectively.

$$a = \frac{dm}{(w - y) + f)}$$

Form of Light Beam

The value of the aerial image to projectionists in the days of front-shutter mechanisms was that the image is sometimes (but not always) smaller than the effective clear diamenter of the lens, and accordingly formed the narrowest part of the light beam. A shutter cuts the light most rapidly in this constriction of the beam, permitting the blades to be trimmed to a minimum angular width for maximum light transmission.

Whether or not an hour-glass constriction is actually present in the light beam a few inches in front of the lens depends on whether the diameter of the aerial image is smaller than the effective clear diameter of the lens (the E.F. divided by the "f-speed"). For 3-, 4-, and 6-inch lenses of the usual speeds, these effective clear diameters are:

3-inch: f/2.5 = 1.2″
f/2.0 = 1.5″
f/1.9 = 1.58″
f/1.7 = 1.765″
4-inch: f/2.5 = 1.6″
f/2.0 = 2″
f/1.9 = 2.1″
f/1.7 = 2.35″
6-inch: f/2.5 = 2.4″
f/2.0 = 3″
f/1.9 = 3.158″
f/1.7 = 3.5294″

In the examples above, using a 14″ mirror at a 35″ working distance, a constriction in the light beam will occur with all f/2.0, f/1.9, and f/1.7 lenses, but



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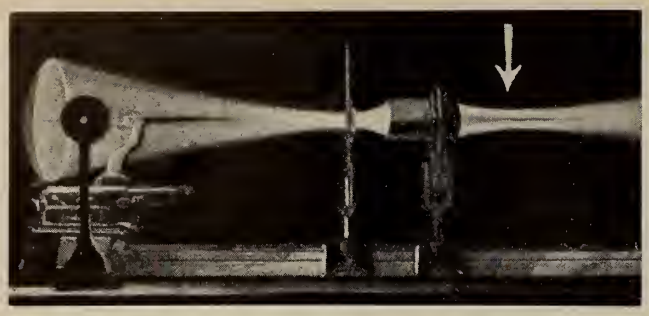


FIG. 4—This is a photograph of the constriction present in the light beam when the aerial image is smaller in diameter than the lens. The arrow points to the plane of the aerial image where, if a dark cardboard were interposed, a sharp image of the lamp mirror and positive-carbon holder would be seen. This photo was made by blowing smoke into the light beam of a demonstration setup on an optical bench.

not with the slower f/2.5 lenses. The constriction may actually be seen by blowing cigarette smoke through the beam in front of the lens.

The late Frank H. Richardson often advised positioning the front shutter in the plane of the aerial image and trimming the blades to take advantage of the more rapid cutoff. Unfortunately, the aerial image was somewhat larger with the old low-intensity condenser lamps than with mirror lamps; and the lenses in general use years ago were rather "slow" (f/2.5 to f/2.3).

With 6-inch diameter condensers about 12 inches from the film aperture, the aerial image of the front condenser (converger) was 1½ inches in diameter with 3-inch projection lenses, 2" with 4" lenses and 3" with 6" lenses. Since the effective clear diameters of f/2.5 lenses in these focal lengths are 1.2, 1.6, and 2.4 inches, respectively, there was no constriction of the light beam in any case. Accordingly, the front shutter worked most efficiently when positioned as close to the lens as possible—the narrowest part of the projected beam of light when the aerial image is larger than the lens.

"Stereopticon" System

Other types of optical systems have been used in projection, but only rarely for professional motion-picture projectors. The stereopticon system, for example, employs a condensing lens of a diameter just large enough to include all of the rectangular area of the slide format. The slide is placed close to the condenser, and the light source is focused by the condenser upon the projection lens. In this type of optical system the lens can be relatively "slow" and still work with maximum light transmission efficiency.

The adjustment of the arclamp for 70-mm projection is to a small degree suggestive of the stereopticon system. The "spot" is focused upon or inside the projection lens by moving the lamphouse forward, thus insuring that the large aperture will all be included in a sufficiently wide beam of light.

The relay-condenser system, described several times in past issues of *IP*, is useful when the light source is irregular in shape, as is the case with incandescent (mazda) lamps. The main condenser collects the light and forms a somewhat enlarged image of the glowing filament upon a secondary condenser which, in its turn, forms a reduced image of the evenly illuminated main condenser upon the film aperture. The well-known German "honeycomb condenser" is an ingenious adaptation of the relay principle to the reflector arclamp.

Arc Mirror Functions like a Lens

The deep concavity of the conventional arclamp mirror has an ellipsoidal, rather than a simple spherical, form to eliminate spherical aberration and thus image the arc crater better. It has two conjugate foci, just as a convex image-forming lens has. The intensely brilliant crater of the positive carbon occupies one focus of the mirror. The other focus is occupied by a somewhat enlarged image of the crater—the "spot." The distance from the mirror to the positive-carbon crater is called the "geometric focus," and the distance from the mirror to the "spot" on the projector aperture plate is known as the "working distance."

While it is sometimes necessary to vary the working distance of an arclamp mirror by an inch or less either toward or away from the aperture, it is best to use the exact working distance specified by the manufacturer of the lamp.

The optical speed of an arclamp mirror is found by subtracting the depth of the concavity of the mirror from its stated working distance and dividing this difference by its diameter. The speeds of several mirrors in common use are thus found to be as follows:

DIAMETER	DEPTH	WORKING DISTANCE	OPTICAL SPEED
10¼"	1¾"	24 "	f/2.2
11⅜"	2 "	30½"	f/2.5
14 "	3 "	35 "	f/2.3
16 "	3½"	35½"	f/2.0
16 "	3½"	34 "	f/1.9
16½"	3½"	34¾"	f/1.9
18 "	4 "	34½"	f/1.7
21 "	5 "	40¾"	f/1.7

"Matching" of Lamp and Lens

Alteration of the working distance establishes new conjugate foci and actually changes the optical speed at which a mirror works, though, as stated before, it is not advisable to alter the working distance more than an inch either way. The curvature of a lamp reflector is "figured" for a definite working distance. But just to show how optical speed changes with the working distance, consider the 18-inch reflector in the tabulation above. At a working distance of 31" it has a speed of f/1.5; at 32¾", f/1.6; at 34½", f/1.7; at 36½", f/1.8; and at 38¼", f/1.9.

As far as "matching" the lamp optics with the projection lens is concerned (a complex subject), it is generally recommended that the arclamp be equally as "fast" as the projection lens, or if slower than the lens, not more than 0.1 of an f-number slower. An f/1.9 lens, for example, is adequately matched by an f/1.9 or f/2.0 lamp. Little is gained by using a lamp which is faster than the lens.

All Optical Factors Interrelated

Only that part of the total radiation from the positive crater of the carbon arc which is collected by the lamp mirror and reflected toward the aperture can contribute to the illumination of the picture on the screen. Second, only that part of the reflected radiation which passes through the aperture can eventually get to the screen. Third, only that part of the light coming through the aperture which is intercepted by the projection lens and transmitted contributes to screen illumination. These three optical hurdles are inextricably involved in (1) collecting angle and "speed" of the mirror, (2) magnification of the crater image upon

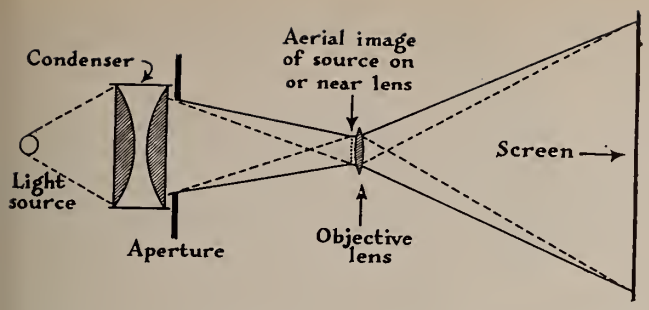


FIG 5—In a stereopticon (called a "dia projector" in Europe) the slide is placed close to the condensing lens, and the image of the light source is formed upon the projection lens. The aerial image of the condenser and the image of the slide are very nearly coincident upon the distant screen. This system has two advantages: it provides very uniform illumination of the screen and makes possible efficient use of relatively small projection lenses (f/4 to f/8).

the film aperture, and (3) the "matching of lamp and lens speeds, or f-numbers.

The crater-image magnification of an arclamp reflector is dictated by two considerations, namely, the diameter of the radiant crater of the positive carbon and the dimensions of the film aperture. The smaller the carbon, the greater must be the magnification of the "spot" on the aperture plate to cover the entire film-frame from corner to corner with uniform illumination. Also, the magnification must be great enough to fill the aperture only with the white central light from the crater, keeping the reddish shell light beyond the edges and corners of the aperture.

In practice, magnifications of from 4 to 6 times are used in 35-mm projection. If you wish to find the exact magnifying power of your lamp mirrors, divide the working distance (mirror center to film aperture) by the geometric focus (mirror center to positive crater).

Even though the magnifying power of a lamp reflector involves its two conjugate focal distances, it has nothing whatever to do with the diameter, or size, of the reflector. But size is important in other ways to the efficiency of an arclamp. The larger the mirror, the greater its optical speed and light-collecting angle—and the brighter will be the picture on the screen.

Modern Lamps Best

The early low-intensity condenser arclamps had a collection angle of only about 45 degrees. Most of the light emitted from the positive crater fell uselessly upon the front wall of the lamphouse. Modern reflector lamps intercept solid angle of arc radiation ranging from 120 to an impressive 155 degrees, the latter value being close to the maximum for the cup-shaped positive crater. Only such revolutionary new light sources as the cylinder-shaped "blown arc" utilize larger collection angles—more than 260 degrees in the Strong Jetarc lamp with its 21-inch main mirror and spherical auxiliary reflector.

Clarity and brightness are the two factors of visibility—the "viewing quality" of the picture on the screen. Remove the lens from the projector or smash the lamp mirror, and you have no picture. One component is as necessary as the other. The public will not tolerate dim or blurry projection, and yet the use of damaged lenses and tarnished, badly pitted arclamp mirrors continues. But it can't continue forever. The moviegoing public will patronize only those theatres where really first-class projection prevails. **iP**

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Wireless Speakers May Solve Theft, Maintenance Problems

PASADENA, CAL. — Wireless speakers for drive-in theaters are a new product of Wiancko Engineering Co. here. The wireless speakers were developed to provide the customer with quality sound and freedom to move speakers anywhere in the car. Theater operators will eliminate theft and reduce maintenance costs that are a significant factor in their annual budget, the company feels.

"MC Sound" (magnetic coupling) has been in development for several years. It was necessary to wait for transistor costs to reduce and efficiency to improve before this product could be marketed, Wiancko states. It owns the rights to patents obtained by Harold W. Rosenberg.

MC Sound is the first interference and distortion free audio transmission system developed expressly for restricted area use. It is the first major change in drive-in theater sound systems since 1932. There are no posts, junction boxes, or individual wiring circuits to the speaker. The patron can place his speaker anywhere he wishes in the automobile without the restriction of speaker lead wire.

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The speaker unit employs a battery-operated transistorized circuit. The battery will last nine months or more under normal use. A mercury switch turns the speaker on when it is handed to the patron in an upright position, and the unit is turned off automatically when the speaker is stored face down.

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This system can also be used in existing theaters by laying the gen-





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erating loop without removing the existing wiring. Any theater sound amplifier can be used to generate signals for this system. Amplifier power output requirements are less than for wired systems.

When constructing a new drive-in theater, the MC Sound system can increase land use by allowing higher density parking. The land may be used for other purposes during the day, such as parking for shopping centers or industrial parks.

Portable theaters can be developed for resort areas that are restricted to operation for a few months out of the year. Generators, projectors, amplifiers, and speakers can be stored or transferred to another location during the off season. The only permanent installation needed is the generating loop which is wire laid in a simple trench. Capital investment fixed to the land is greatly reduced, Wiancko points out. **iP**

CINERAMA

(*Continued from page 3*)

"The Wonderful World of the Brothers Grimm" is buttressed by improvements in the CinemaSound, which is perfectly synchronized, a complicated and intricate sound system that has "total surround" sensation to the audience. The sound is by a 7-channel 35 mm magnetic film, dimensionally the same as the picture film and runs on a separate reproducer that is electrically interlocked with the three projectors running at the same speed as the picture.

The Cinerama sound system has undergone improvement through the years but its big leap forward has been during the last two years when the MGM association with Cinerama in making the productions of "The Wonderful World of the Brothers Grimm" and "How the West Was Won."

The MGM production in Cinerama, "How the West Was Won" to follow "The Wonderful World of the Brothers Grimm," no doubt will give a new lease on life to the process, and there will be many more theatres installing the Cinerama in this country and abroad.

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By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

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1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
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8. Noise Measurements and Techniques
9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
11. Noise in Communication Systems

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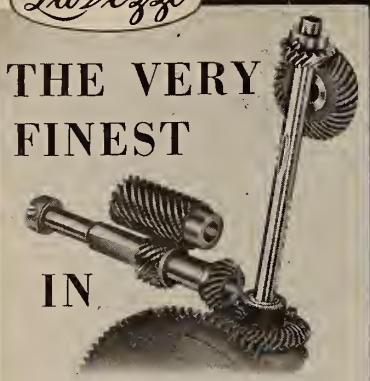
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The New Loew's Setup for Cinerama

East Gets Top-Notch New Cinerama; 3,000 Sq. Ft. Screen

NEW YORK— Loew's Cinerama here is completing the final stages of a million-dollar reconstruction which is turning it from Loew's Capitol into the most modern Cinerama showcase.

The conversion will be completed for the Aug. 7 premiere of the first dramatic film in Cinerama, the MGM-Cinerama release, "The Wonderful World of the Brothers Grimm."

For more than four months, techicians have been working on the theater. Until June 20, they worked late at night while the theater was still in operation. Since the 20th, the theater has been shut down.

A major feature of the new theater will be the huge Cinerama screen which will more than triple the view ing area of the largest screen the Capitol ever used.

The 33 by 93 foot louvred screen covers over 3,000 square feet from wall to wall and floor to ceiling. This will give the audience the maximum participation effect through a 146 degree viewing area which approximates that area encompassed by human sight.

Bottom masking is created by the stage floor which rises from the first row. The ceiling provides the upper masking.

The seating capacity of the theater has been reduced to 1552 from the former 3612. The side aisles in the orchestra, the last thirteen rows, half the balcony, and a third of the loge have been eliminated.

The three Cinerama projection booths are placed in the orchestra above the heads of the audience. Coupled with the technical improvements in the Cinerama process, the theater will present the most impressive projection ever seen in New York.

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room and an unobstructed view of the giant screen.

Looking up, the audience will see a new ceiling that will rise from the top of the screen to the back of the balcony, completely covering the dome-like ceiling of the original theater.

The ceiling, carpets, curtains, and seats are all in the same bittersweet shade, a background considered the most flattering to the women in the audience no matter what colors they may wear.

Two innovations will be featured at Loew's Cinerama.

One will be the Babyrama, downstairs below the orchestra, which will provide a completely furnished, and professionally staffed nursery so that parents can see the picture while their tots and toddlers are cared for. Its service will be free, and patrons can reserve a ticket in the Babyrama when they purchase their regular tickets.

The second will be a typical Japanese Garden which is under construction at the entrance to the theater in back of the auditorium.

Everything in the Garden will be authentic, from the bamboo fences to the oriental stones which will line the pool. A wooden bridge will offer easy access to the patrons who will want to stroll through the garden before and after the performance and during the intermission.

The Loew's Cinerama construction is a part of a $17,000,000 construction program for Cinerama theatres throughout the country. **iP**

New Book on Transistors, Circuits

Transistor Engineering, and Introduction to Integrated Semiconductor Circuits by Alvin B. Phillips, Assistant to Vice President and General Manager, Semiconductor Products Division, Motorola, Inc. 366 pages plus index, 208 illustrations; 6x9; McGraw-Hill Series in Solid-State Engineering; $12.00. Publication date: July, 1962.

"Transistor Engineering" is designed to equip the reader with a basic understanding of the principles of transistor theory and design so that he can directly relate any of the DC or high-frequency parameters and characteristics to the physical properties of the transistor. The principles developed in the book are also applicable to the design of semiconductor integrated circuits (microcircuits)—one of the fastest growing aspects of modern-day electronics.

While not a book on semiconductor process technology, "Transistor Engineering" does present theory which is adequately complete to be universally applicable to all transistor structures ranging from the early grown-junctions to the most recent epitaxial-planar devices. Thus, any transistor design may be *synthesized* from designated electrical characteristics, or any electrical characteristic may be *analyzed* from a designated transistor design.

Phillips uses a "building-block" approach in which each chapter is dependent on material preceding, and new aspects are introduced in logical order. The reader, in this manner, attains a progressive understanding of design theory by which he can understand any transistor in use today.

The first chapter acquaints the reader with the many and varied transistors. The second chapter provides a qualitative treatment of solid-state physics to introduce the concept of energy bands. Chapters 3 and 4 explain what semiconductors are, and give a detailed description of carrier phenomena and the measurable properties of semiconductor materials. Chapters 5 and 6 introduce and deal fully with the theory of the p-n junction. Chapters 7, 8, and 9 introduce transistors first from a qualitative and then from a quantitative point of view. Chapter 10 extends the low-level theory to explain the DC properties of transistors at high currents.

With the DC behavior as a reference, chapters 11 and 12 bring in the low-frequency characteristics of transistors. Chapters 13 and 14 extend the theory into the high-frequency performance of transistors. Chapters 15 and 16 treat the device as used in amplifiers and switches. Finally, chapter 17 demonstrates the application of the theoretical principles to the various transistor types.

The book covers all recent advances in transistors—including epitaxial and planar transistors, as well as the most recent data on the properties of germanium and silicon. Included also are requirements for optimum design and/or performance of devices for either amplifier or switching applications.

Alvin B. Phillips is assistant to vice president and general manager in the Semiconductor Products Division of Motorola, Inc. He has been actively engaged in the field of semiconductors for 10 years in the engineering, production, and marketing phases of transistors. **iP**

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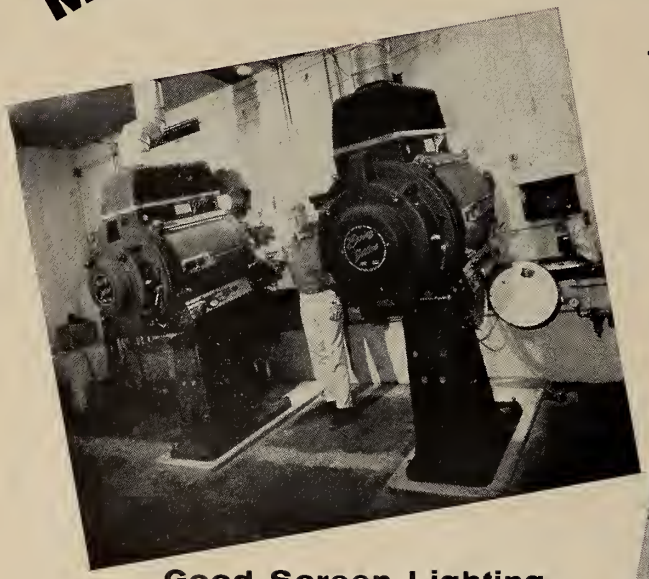
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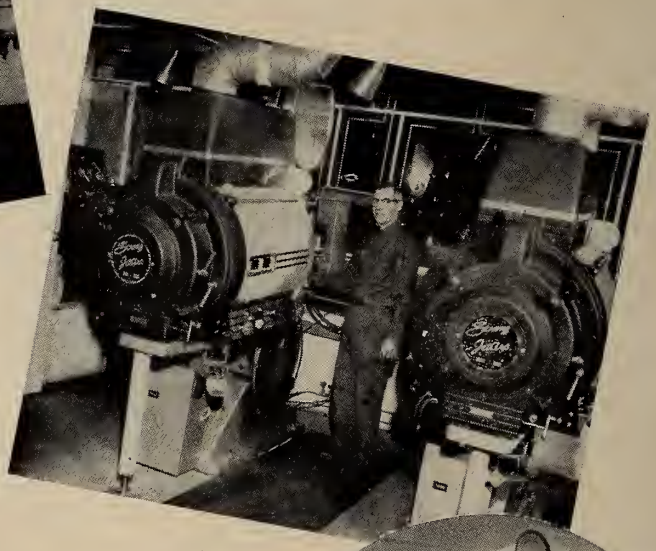
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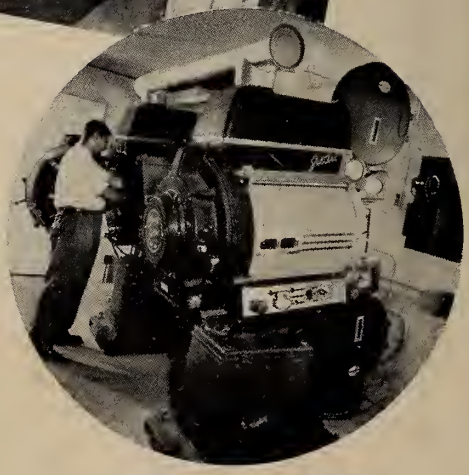


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Volume 37 September, 1962 No. 9

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INTERNATIONAL PROJECTIONIST, published monthly by the Internotionol Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesoto. Editorial offices, 1645 Hennepin Avenue, Minneopolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND ond ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canado, ond U. S. Possessions, $3.00 per year (12 issues) ond $5.00 for two years (24 issues). Foreign countries: $4.00 per year ond $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneopolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions oppearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

The "Art Theatre" Trend Promising

The mere mention of the term "art theatre" conjures up many memories for our technical writer, Bob Mitchell. His first full-time operating job was in a summer art house which featured uncut foreign films interspersed with a generous program of live concerts, opera, and ballet. It was a ritzy operation. The theatre, called a Building of Arts, was filled with fresh flowers every day. Jeweled lorgnettes flashed during "curtain teas" at which society caterers served exotic *hors d'oeuvrs*. And the screen fairly scintillated with films of classic sature.

Expansion and Prosperity of "Arties"

In those days an art theatre catered only to a small and commercially insignificant minority — the intellectual snobs, the wealthy pretenders to culture, and a few genuine devotees of the off-beat. These audience types are still with us; but the art theatre, in expanding beyond them, has captured an important new patronage of mature movie-lovers. And you and I, as projectionits, may well paraphrase Tiny Tim: "God bless them, every one!"

Things are now "loowing up" for theatrical motion pictures; and the growth of the art house — the theatre of films for the discriminating adult — has been stimulated by the sunshine of a new prosperity. Movie attendance is up about 20 per cent over the 1957-1958 slump; and the number of theatres devoted to the mature, artistically good motion pictures has increased by the same percentage.

Now, the art house is a small, intimate-type theatre. Many "neighborhood" grind houses can be, and have been, housecleaned, redecorated, and re-equipped and successfully converted into attractive showplaces for the "little" films which are often superbly entertaining and which the downtown superdreadnaughts and many driveins must necessarily pass up.

More, not Larger, Theatres

There are many, many kinds of feature films; and in each category we find excellent productions. The gorgeous, wide-screen spectacular costing millions of dollars may be just as good as an example of its class, as the artistic character study of mood films, and, of course, far more profitable to its producer. But the point I wish to make is that there is ample room and an increasingly insistent public demand for *all kinds* of motion pictures, providing they are *good* motion pictures.

Turning our attention to the "art" film exclusively (an appellative which is not accurately descriptive, by the way), we can envision a resurgence of small theatres on every main street, byway, and corner. More theatres, rather than larger ones, would be a healthy thing for our industry and a tremendous blessing to the projection craft. Let us speedily have them and an ample supply of films to show in them. **iP**

INTERNATIONAL PROJECTIONIST

Volume 37 September, 1962 Number 9

IATSE Moves to Enlist all Theatre Employees, Speaks Out Against Runaway Production

LAS VEGAS — Moves to reduce runaway production, control new film processes and bring all theatre employees under the IATSE were discussed at the convention of the organization here recently.

Richard F. Walsh, IA president, said union membership should be extended to cashiers, ticket takers, ushers, doormen and maintenance men. "If the IA does not move to organize those still unorganized in the theatre business, someone else will."

"I realize there are many problems connected with organizing the type of people here involved." Walsh said, "but we cannot shut our eyes to these problems. We must at this convention determine a method by which all of the workers in the theatre can be brought under the banner of the IATSE and its local unions."

The unions called upon Walsh to do everything possible to stop runaway production that they claim is costing their members thousands of jobs.

John Lehnners told delegates that producer representatives cite the primary reason for "runaways" as being not lower costs in Europe but subsidies up to 80% of the cost of films, and tax savings, largely by stars.

Walsh said he had learned that legislation closing tax loopholes pertinent to runaway production, was imminent.

"Many groups within the labor movement," he said, "are out to build large memberships, regardless of where or how they get the members. In many places we have had trouble with these organizations, for they do not hesitate to come in and demand NLRB elections and state labor board elections to cover people who normally would be under the jurisdiction of the IA local."

Walsh said he would personally appear before the Special Committee when it considers the organizing proposal "to counsel with them and see if we cannot come up with recommendations of an effective means of extending membership to the unorganized people within our theatres."

The rise of the "big negative" and improved optics are the most significant technological developments in the industry, Erle Chamberlin, editorial administrator for MGM told IA delegates.

"The big negative is continually becoming more popular." Chamberlin declared. "There are more pictures being photographed and scheduled in Super Panavision, Todd-AO, Technirama, and MGM Camera 65 than at any time in the history of our industry.

Chamberlin said that the big negative films will require a new high in cooperation at the time of their release. "Mutiny on the Bounty" and "How the West was Won," he said demonstrated that the dramatic content was too great for the regular 30-inch Cinerama reels.

"We had hoped that this problem would not exist after final editing, but it was necessary to obtain a modification of all Cinerama reproduction equipment to accommodate a 34-inch reel.

"This in turn made other modifications necessary—booth space, carbon trims, lenses, and many others; also an adidtion, a reel lift because of the added weight. All these big negative and Cinerama shows should keep your motion picture and hard ticket personnel busy for quite a spell."

As for improved "optics," Chamberlin said that these have been accomplished through use of better glass and higher precision in grinding.

"As a result, the new lenses are naturally more expensive," he said, "but in our considered opinion the increase in quality is well worth the additional expenditure."

The speaker asked cooperation of delegates in helping to track down the offender in a technological "Who-Done-It?" New protective coatings have been applied to reduce film wear for the past two years, he recounted. For a while all went well, he said. Then, a year ago, there appeared isolated cases of film sticking, a white dust on projector rails, plus other disturbing complaints.

"Now a question arises in our minds," said Chamberlin. "Are there other cases of this sort that haven't been reported? If so, I'd appreciate hearing about them, so that we can find out if the coating is truly at fault," he said.

Film producer George Stevens won unprecedented official commendation from the International Alliance of Theatrical Stage Empoyes for his plans to photograph "The Greatest Story Ever Told" entirely within the United States at a time when runaway production oveseas has sorely sapped American employment.

The eleven hundred delegates in biennial convention at Las Vegas unanimously passed a resolution putting the unions on record commending the veteran film maker for proving that "great motion pictures can be made in the U .S. despite the fact that other producers of motion pictures have elected to make films in other lands" and for "giving employment to hundreds of citizens of Los Angeles" and aiding subcontractors and suppliers who service the industry.

Introduced by Herb Aller, business agent of the Cameramen's union (Local 659), the resolution further commended Stevens for his "patriotic and loyal spirit" and extended the convention's "deepest appreciation for his everlasting efforts in behalf of all Americans."

"The Greatest Story Ever Told" is the life story of Jesus Christ, inspired by Fulton Ousler's book of that name.

Passage of the resolution underscored the intention of the IATSE to fight the trend to foreign shoot-

ing of American pictures by organized support of important features made here. Each of the members of IATSE and the more than 13,000,000 AFL-CIO members nationally will be involved in a grass roots campaign to support "The Greatest Story Ever Told" when it is released late next year.

The Stevens film for release by United Artists will be studio-filmed in Los Angeles with Holy Land locales duplicated in Nevada, California, Arizona and Utah at a cost of many millions. Los Angeles area construction trades alone will benefit by over 35,000 man days of labor and well over 100 speaking roles will be supplemented by an estimated 30,000 man days of employment for extras and bit players. This comes as a manna at a time when film industry payroll rosters are at a critically low ebb.

It is the hope both of Stevens and the projectionists that successful completion of this mammoth undertaking here will stir other film makers to return their operations to this country from overseas. Many of the film guilds have clarified their contracts to facilitate filming of "The Greatest Story Ever Told" here, mitigating what Stevens in the past has scored as unfair penalization of large-scale production in this country.

In his annual report to the convention Harland Holmden, secretary-treasurer, said IA had net assets of $1,496,906 at the end of the two-year period on June 30, 1962.

Convention expenses will be paid for out of a separate transportation and per diem fund of $318,288. An initial contribution of $180,300 was made to the IATSE retirement fund.

Income for the two-year period ending last June 30 amounted to $1,840,798, of which $1,510,234 was from the per capita tax .

Salaries of officers, international representatives and trustees, and miscellaneous assignments amounted to $749,193 for the two-year period.

iP

Plastic Reel Name Changed

NEW YORK — Walter Elterman, president of Plastic Reel & Core Co. of Weehawken, N. J., has announced a change in the corporate name of his company.

The new name that the company will operate under is Plastic Reel Corp. of America. The company's principal source of business is derived from selling plastic reels to the film and television industry and 8mm and 16mm return reels for the amateur field. **iP**

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ROCKSTEADY PICTURES A PROJECTION REQUISITE

By ROBERT A. MITCHELL

THE MODERN professional motion picture should be so rocksteady on the theatre screen that no vertical "jumping" or horizontal "weave" is visible to the audience. This degree of perfection is extremely difficult to obtain, though it is very closely approached in theatres where reasonable care is accorded the projector mechanisms. A small amount of sideweave is usually present, and is especially noticeable when it exceeds the vertical unsteadiness in magnitude. This is the chief fault of the CinemaScope anamorphic process.

Sideweave—a swaying of the picture from side to side—usually can only be reduced, not completely eliminated. The usual construction of the older theatre-projector film gates and guide rollers allows the film an appreciable range of lateral movement at the aperture. "Studio" guide rails are helpful in projectors *only* if the outer one (the one nearest the projectionist as he stands at the operating side of the projector) is so positioned that the spring-loaded flange of the guide roller at the top of the gate holds the film firmly against it. Even so, the incorporation of studio guides in theatre projectors was more a measure of desperation than a manifestation of engineering ingenuity.

The Motiograph AA has an additional lower set of flanged guide rollers to eliminate sideweaving of the picture, and all curved-gate mechanisms reduce weave to an inconspicuous level. But it remains an unfortunate fact that the older flat-gate projectors place the projectionist at a distinct disadvantage. Just about all the advice we can offer anent the reduction of this particularly troublesome defect was given in the November 1961 issue of IP ("Sideweave: Projection's No. 1 Problem").

Rocksteady Pictures a "Must"

There is less excuse for the presence of vertical jumping, jiggling, or dancing of the picture than for sideweave, although this defect is sometimes inherent in the print, and therefore not the fault of either the projectionist or his machines. Projectionists don't make the prints: they reproduce as faithfully as possible only what has been photographed on the film, the bad as well as the good. We can't improve a bad print, but we can, and must, make certain that a *good print* gives a *good picture* on the screen.

Whenever an undamaged print of high quality gives an unsteady picture, we know that a serious defect exists in our projector mechanisms—a defect which demands immediate correction to safeguard the theatre's business.

Most of the film programs broadcast from 35-mm prints on the major TV networks are remarkably rocksteady. The rocksteadiness of 35-mm TV projection is due, of course, to the general use of claw intermittents with cycling registration pins which insure 100% accurate registration of the film frames.

Claw intermittents are also used in professional 35-mm cameras and printers, but not in theatre projectors because movements of the shuttle type are rough on film and rather unsatisfactory with worn prints. Accordingly, theatre projectors must use sprocket intermittents of the geneva, drunk-cam, or pin-cross type of movement.

Rationale of "Overshooting"

Sprocket movements are rugged, dependable, safe, and capable of great accuracy when well made. Ignoring for the present imperfect registration caused by maladjusted, worn, or damaged parts, all sprocket intermittents suffer

from the handicap of sprocket teeth which do not fit the film perforations snugly, but are necessarily somewhat undersize. Unfortunately, this allows the film to slip, or "overshoot," on the face of the intermittent sprocket under certain conditions. When this happens, the picture jumps violently on the screen.

This writer suspects that a relatively small degree of overshooting is rather common in normal operation when the sprocket teeth are abraded and the gate tension is wrongly distributed.

The film comes to a stop in the gate the moment the intermittent sprocket stops turning *only because of the frictional pressure of the gate tension pads on the margins of the film.* The friction produced by the pads is the only thing that arrests the film, which would otherwise keep on traveling downward under its own momentum, slipping on the smooth face of the intermittent sprocket until the top edges of the film perforations bring up against the sprocket teeth.

Even though the excess distance traveled by the film when it overshoots amounts to only about half a millimeter (almost .02 of an inch), this distance is approximately 50 *times the maximum allowable registration error* in a 33-mm projector. To appreciate the seriousness of complete overshooting, bear in mind that a ½-mm movement of the film at the aperture results in a movement of the image on a screen 40 feet wide of nearly one foot.

This extreme degree of picture-jump is observed on those rare occasions when the soft emulsion of a "green" print melts on the heated gate runners and allows the film to overshoot.

All degrees of overshooting could be obviated by making use in 35-mm projectors of perforation-fitting registration pins which oscillate in and out of the perforations close to the aperture to insure perfect registration of the film each time the intermittent sprocket comes to rest. Registration pins are employed in cameras and printing machines for preparing step-printed master-positive, duplicate-negative, and optical effects films, but they are not practicable for projectors because they must be accurately dimensioned to fit one special size and shape of film perforation. Other methods must be resorted to in order to eliminate from 35-mm projection the rather spectacular picture-jump of overshooting.

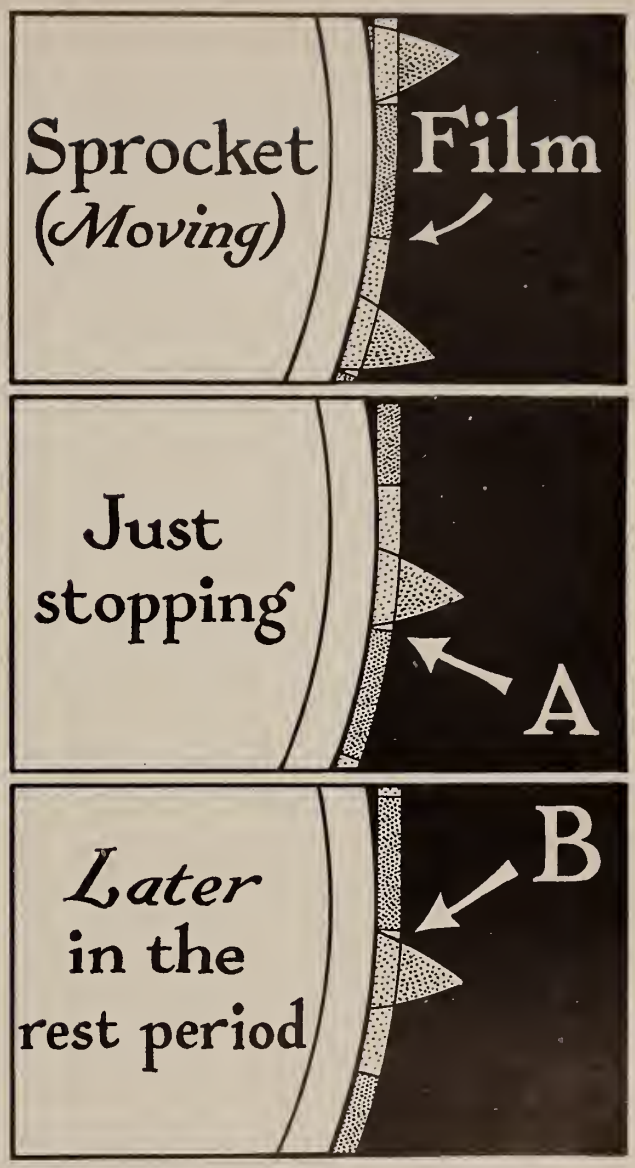


FIG. 1 — How "overshooting" of the film takes place. The intermittent-sprocket teeth engaged in the film perforations pull one frame of film down in the gate. The sprocket then comes to a stop. But when gate tension is insufficient, or when softened emulsion from a "green" print is present on the film runners, the film continues to slide down on the face of the motionless intermittent sprocket until the top edges of the perforations bring up against the teeth, as shown in the bottom panel. The overshooting may amount to only about half a millimeter, but causes the picture to jump almost a foot on the screen! We avoid overshooting by using minimum pad pressure on new prints, oiling the edges of the film only when absolutely necessary.

Prevention of Overshooting

The most effective remedy available to the American projectionist for the prevention of overshooting is adequate lubrication of the new prints. This is provided by the film laboratories and exchanges, and ordinarily consists of a coating of special wax along the perforation margins on the emulsion side of the film. If a "green" print gives trouble during its first showing—"chattering" in the gate, depositing bone-hard accumulations of emulsion on the gate runners, and overshooting to give a jumpy picture on the screen—it is advisable to oil the film by rubbing the edges of both sides of the film roll with a lightly oiled wad of cloth, following the convolutions of the film layers.

Projector oil is satisfactory, but an extra-heavy white mineral oil, such as that sold by drugstores, is even better.

We absolutely do not recommend the application of oil to the margins of the film as it runs through the projector. This method of oiling prints is messy, soils both film and projector, fogs the projection lens, and induces sideweave if the oil is applied first to one edge, then to the other edge, of the film.

Most European projectionists have velvet-faced film runners at their disposal for running unwaxed laboratory prints. Special runners made of plastic are sometimes used in studio projection rooms: and one American manufacturer (Motiograph) has successfully made use of bamboo runners for this purpose.

A number of kinds of picture unsteadiness are known which can be separated from factors beyond the projectionist's control, such as worn prints (damaged or weakened perforations), faulty printing (as from badly shrunken negatives), faulty functioning of the camera

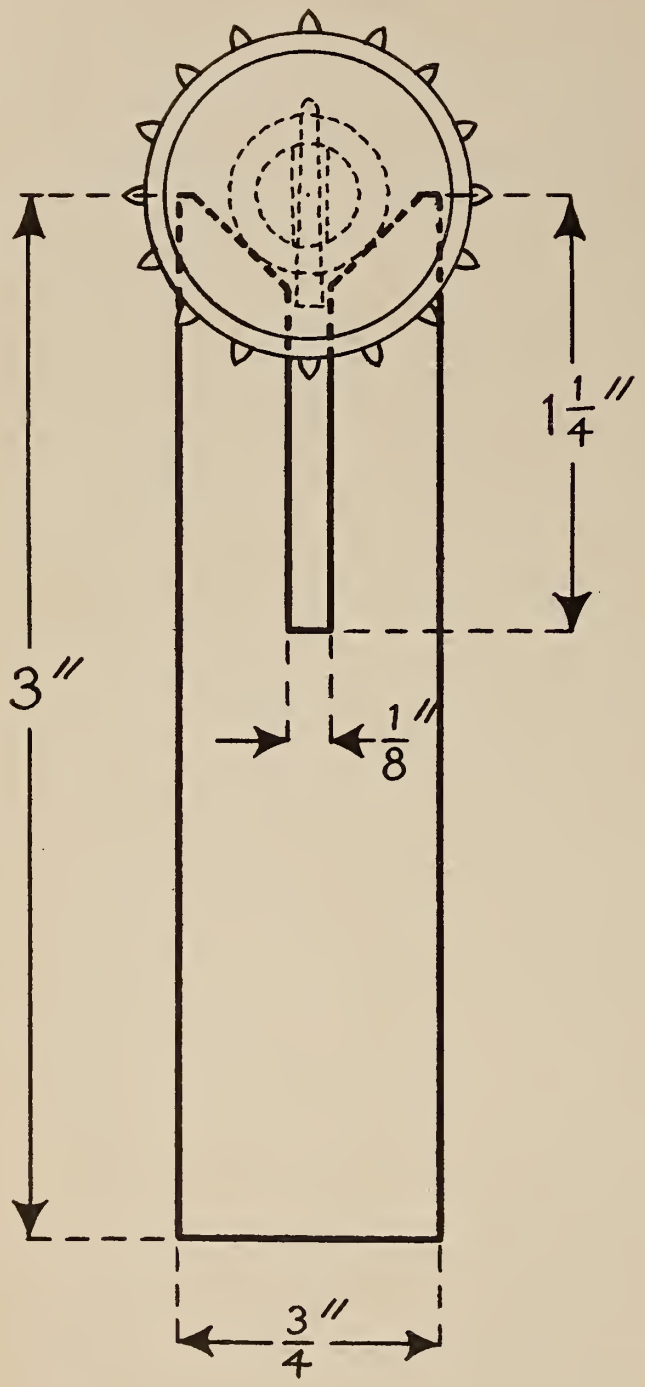


FIG. 2 — Dimensions of a V-block used for removing and replacing the taper-pins of intermittent sprockets. The block, either ¾ or ⅝ of an inch square, may be made of brass or a stiff lead alloy such as printer's type metal. The "V" at the top has sides inclined at right angles to each other, and serves as a rest for the shank of the sprocket. Note the slot into which the pins may drop. Every projectionist operating on "Regulars" or "Supers" and doing his own intermittent overhauling should make or buy a V-block and obtain a small bench-vise to hold it solidly. Use of a V-block insures against damaging the intermittent when changing sprockets. "Mitchell's Manual of Practical Projection" tells how to change sprockets and repair Super Simplex movements.

intermittent, and an unsteadily supported camera (as in newsreel shots taken with a hand-held camera).

Other Obstacles to Rocksteadiness

1. Rapid "dancing" of the picture in a 6-cycle (4-frame) period may be slight or pronounced, depending upon the magnitude of the defect in the projector intermittent. The regularity of the jiggling makes this defect especially annoying to the audience. It is caused by badly worn intermittent-sprocket teeth, a lop-sided sprocket (one not accurately centered on the starwheel shaft), a bent starwheel shaft, or a damaged starwheel.

Users of the old Powers projectors will encounter the same 6-cycle dancing of the picture whenever the pin-cross roller pins are badly worn.

When 6-cycle dancing occurs with a geneva movement, replacement of the intermittent sprocket usually eliminates the trouble. If this fails to steady the picture, replace the starwheel and shaft. Naturally, if a spare intermittent movement in good working condition is at hand, it should immediately be put into service and used until the old movement has had a complete overhaul. If the projectionist does his own repair work, he should guard against rough handling of the movement when removing and replacing the taper-pins used for fixing the sprocket of old-style movements to the starwheel shaft.

We know of several cases where 6-cycle picture dancing was produced by an off-balance soundhead flywheel which caused the entire projector to vibrate with a rocking motion. This possibility is worth investigating (by the method explained near the end of this article) where old-style soundheads are used and whenever a strong vibration can be felt in the frame of the running projector.

2. Misregister blurring of the picture, sometimes mistaken for bad focus, is a very rapid, short-range picture jumping usually caused by worn bearings in single-bearing movements of the kind used many years ago in the Simplex Regular. This defect sometimes shows up as a sharply defined haze over bright picture detail. The cure? A brand-new double-bearing movement of the Super Simplex type. Single-bearing movements are no longer manufactured; and most repair shops refuse to overhaul them.

3. Rapid irregular picture-jump, if not the fault of the print, may be caused by worn sprocket teeth, incorrect or improperly distributed gate tension, insufficient pressure of the intermittent film shoes on the face of the sprocket, backlash between star and cam, or a loose framing ring.

Looseness of the entire intermittent case is easy to detect. Backlash between star and cam is detected by feeling of the intermittent sprocket when it is in the locked, or "at-rest," position. If the sprocket rocks, or even makes a clicking sound when tried with the fingers, the movement will have to be taken from the mechanism and the star-and-cam relationship correctly established by loosening, and then re-tightening, the cover screws. Complete directions for the readjustment of Simplex-type intermittents are given on pp. 83-89 of the *Manual of Practical Projection* obtainable from IP.

Check the condition of the sprocket teeth by examining them with a strong magnifying glass and passing the sharp edge of a jackknife blade over the pulldown sides of several of the teeth from the base of each tooth toward the tip. A "click" indicates a notched or undercut tooth which may cause picture unsteadiness and also damage the perforations of the film. Check the gate tension and correct any uneven, excessive, or insufficient pressure conditions which may be discovered.

Pad Pressure Important

It might seem that gate pressure is a matter of negligible importance to the steadiness of the screen image, but this is a wrong conclusion. The tension of the pressure pads is very important even when the intermittent movement is functioning perfectly. Keep in mind that only the "drag" of the pad pressure on the film enables the film in the gate to come to a stop when the intermittent sprocket stops turning. The film would overshoot without pad pressure. That is to say, it would keep on traveling a short distance (about ½ a millimeter) by sliding down on the face of the sprocket until arrested by the sprocket teeth. As the film slides down, the picture jumps up on the screen—rather violently, in fact.

It has been found that a total drag on the film of from 6 to 18 oz. is sufficient for nearly all types of print, the lower pressure being best for "green" prints to prevent "sticking" and consequent overshooting, and the higher pressure for old, well-seasoned prints to pressure pads is very important even when the intermittent vent overshooting, from their greater "slipperiness." The average first-run theatre does best with 8 or 9 ounces of gate pressure (measured by drawing a short length of film attached to a spring scale up through the gate), while the average subsequent-run house finds 10 or 12oz. best.

There are usually two sets of pressure pads in the gate door of a flat-gate motion-picture projector, one at the aperture and the other nearer the top of the gate. Experience leaves no doubt that the set of pads at the aperture should be adjusted to exert greater pressure on the film than the upper set of pads, otherwise a slight amount of unsteadiness may appear on the screen.

Another Kind of Overshooting

No good reason for this rule has ever been presented, though it seems likely that microscopic irregularities in the pulldown surfaces of the intermittent-sprocket teeth induce a type of overshooting which is limited by the natural rigidity of the film in the gate. The farther the point of maximum gate pressure from the intermittent sprocket, the more the film will "stretch" and "bounce" out of register on the sprocket teeth. Indeed, a series of short-range oscillations may be set up which cause the film to creep down from the sprocket teeth by a very small fraction of a millimeter — say from .02 mm (.0008 in.) to .05 mm (.002 in.).

By having the lower set of pads—the ones at the aperture—exert most of the pressure, the "stretch-and-bounce" length is shortened and the overshooting reduced. The result: a steadier picture.

As a rule of thumb, therefore, we strongly advise adjusting the springs so that the pads at the aperture exert about twice as much pressure on the film as the upper set of pads. That is, for an average total gate tension of 9 ounces, the aperture set of pads should exert 6 ounces, and the upper set 3 ounces. Naturally, since notched and score sprocket teeth may aggravate this type of overshooting, the condition of the teeth should be checked at least twice a year, and the sprocket reversed or replaced when signs of undercutting are detected.

Gate tension should be the same on both margins of the film—4½ ounces per side for a total of 9 ounces. An excess of tension on one side or the other probably does not cause vertical unsteadiness of the picture, but it is surely conducive to sideweave.

Users of curved gates find that buckling, film flutter, side-weave, and possibly vertical unsteadiness are appreciably less than when old-style flat gates are used.

VERTICAL UNSTEADINESS TABLE

	ASPECT RATIO	APERTURE HEIGHT (Inches)	JUMP FACTOR
(Full-frame pulldown)		(.7500)	0.80
Full-width silent film	1.333/1	.6795	0.88
Soundfilm aperture	1.375/1	.600	1.00
"Widescreen" apertures:	1.65/1	.500	1.20
	1.66/1	.497	1.21
	1.75/1	.471	1.27
	1.85/1	.446	1.37
	2/1	.412	1.46
CinemaScope aperture	2.35/1	.715	0.84

Six-Cycle "Dancing" Troublesome

It is the projectionist's first impulse to suspect a worn starwheel or a bent starwheel shaft when the picture dances with a regular 6-cycle (4-frame) periodicity. These defects will indeed cause 6-cycle dancing, but they are not common defects. Much more likely are worn sprocket teeth, a defect which is certainly present if changing the framer position in rotary-framer mechanisms aggravates or reduces it. To prevent the type of wear of the sprocket teeth which causes dancing when the framing position is changed, we have often advised changing the setting of the framing knob every month, and not leave it in the midway position all of the time.

An off-center (lop-sided) sprocket will also cause 6-cycle dancing; and in this case the picture jiggling is completely independent of framer position.

Careless work when installing new intermittent sprockets (or reversing old ones) is more likely to place the sprocket off-center on the shaft than it is to bend the starwheel shaft, itself. A bent starwheel shaft is a very rare complaint.

Taper pins should be removed and replaced by *very gentle tapping* with a small peen-hammer, the intermittent sprocket being firmly seated in a V-block held in a bench-vise. A good V-block can be cast from a half-and-half mixture of plumber's solder and printer's type-metal. This alloy is solid enough to hold its shape, yet soft enough to prevent burring steel or aluminum sprocket shanks.

Better methods fo fixing the intermittent sprocket to the starwheel shaft are employed in the newer projectors—end-screws, nut-and-bolt assemblies, etc. Some of these permit the intermittent sprocket to be removed and replaced even as a daily inspection and cleaning routine!

Maximum "Jump Tolerance"

Why are some projector manufacturers so reluctant to specify the amount of maximum misregistration in the functioning of their intermittent movements? New movements with new sprockets are presumably "run in" and tested at the factory before being shipped out for use. No movement is absolutely perfect: imperfections will be found if we search deeply enough with scientific instruments. But the manufacturer undoubtedly knows how close to the maximum allowable misregistration (10 microns = .01 millimeter = .000394 inch) his own movement comes.

To quote from p. 89 of our *Manual of Practical Projection*:

"Each pulldown of the film over the aperture amounts to 1 frame. The length of 1 frame of film is ¾ of an

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inch (19 mm). If each pulldown is *exactly* 0.75 inch, the picture on the screen will be perfectly rocksteady if the film is properly photographed and printed; but if the succeeding pulldown distances vary slightly from frame to frame, the picture will be unsteady. . . . The maximum registration variation permissible in standard projectors is 10 microns. This is a variation of 0.052% of the total 0.75-inch pulldown distance."

The manufacturer may say that all starwheel and sprocket radii, the pitch of the sprocket teeth, the diameters of all bores, shafts, bearings, etc. are ground to a tolerance of 2½ microns (.0025 mm = .0001 in.), but the possible addition error may well come up to, or even exceed, the 10-micron limit. More likely, a misregistration greater than 10 microns may occur if the sprocket is fastened to the shaft by a method which forces it off center or distorts the shape of the flanges.

The theatre owner will find it to his advantage to insist upon a steadiness test if this registration-tolerance information is not given and backed by a guarantee. Steadiness test films are readily available, and should be projected upon the screen in various framing positions.

Suppose unsteadiness is seen, and the installation men blame machine vibrations for the trouble. (This alibi is a "natural" if old ERPI universal bases are still being used.) All that need be done to test this opinion is pull back the screen masking from one side and from the bottom of the screen so as to reveal the image of the rectangular film aperture. Focus the edges of the aperture sharply and run the machine without film. If the aperture image doesn't vibrate, the machine doesn't vibrate, either.

Aspect Ratio and Unsteadiness

It goes without saying that the higher the magnification of the image on the screen, the greater any jump, dancing, or other unsteadiness will be whether in the print or the projector. The full-frame pulldown is exactly three quarters of an inch: this is the basis of the 10-micron unsteadiness standard. But the heights of the projector apertures in common use are considerably less than .75 in.—that of the old conventional soundfilm aperture is .6 in., and that of the 1.75/1 aspect ratio widescreen aperture is only .471 in. It is impossible, therefore, to construct a table which gives the relative magnitudes of the vertical picture unsteadiness with the different apertures when the amount of frame misregistration in the projector remains the same. It is assumed, of course, that the proper lenses are used with the different apertures to give the same picture-height *on the screen* in every case.

Accompanying this text is a table calculated on the basis of a "jump factor" of 1 for the conventional soundfilm aperture measuring .825″ x .600″ and having an aspect ratio of 1.375/1.

It will be seen from the table that silent-film and CinemaScope pictures minimize vertical picture-jump or dancing, and the nonamorphic widescreen projection exaggerates it. The standard soundfilm aperture and all widescreen apertures up to and including the 1.75/1 aperture are acceptable. The 1.85 and 2/1 widescreen apertures are definitely dangerous to picture quality image-wise as well as lightwise. Because the anamorphic lens doubles the horizontal magnification of the screen image, CinamaScope pictures generally show more side-weave than vertical unsteadiness. **iP**

Modern Trends In Theatre Design

By MASON G. RAPP

The future trend in theatre design involves to a great extent a matter of opinion and a qualified look at the future. However, there are basic conclusions that determined the plan concepts of many of our latest theatres, and possibly these can be illustrated by our approach in the design of the New Fisher Theatre in Detroit, financed by the Fisher Brothers of "Fisher Body" fame.

In the development of the theatre from ancient times the basic audience requirements have not really changed. The audience must be able to see and hear in comparative comfort. I do question the 'comparative comfort' of the uncushioned stone steps of the Green theatre, but can say that our present specialists in theatre seating have improved on this feature!

However, they did accomplish the ability to see well by the use of a steep pitch amphitheatre plan, and the ability to hear well in an intimate atmosphere created by small capacity —average 300 people—also noticeable were certain primitive efforts to reinforce voice to the audience by simple reflection of sound waves.

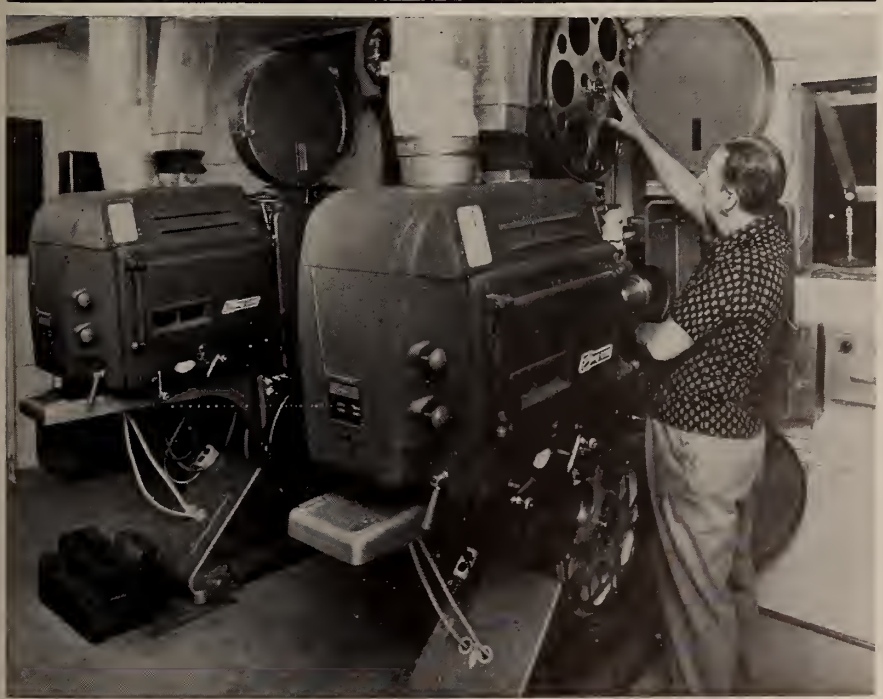
The 19th century music halls in Europe were more acoustically successful in that they were enclosed and contained more seating, but most had flat floors so that seeing was quite restricted.

More recently we have watched the development of the small legitimate house, the small silent movie theatre, the somewhat larger vaudeville houses, the large opera house, the first blasts of the talking picture to the highly scientific sound film systems of the present day.

Obviously through this kind of development most of these existing theatres are not housing the type of production for which they were designed.

I believe it logically follows that the future trend of theatre design

(Reprint of Talk made by Mason G. Rapp of the architectural firm of Rapp and Rapp, Chicago, before the Equipment Dealers and Manufacturers Association at the Sherman Hotel, Chicago)



NEW DRIVE-IN — The new Thunderbird Drive-In Theatre recently opened in Atlanta, Ga., with Strong U-H-I Arc Lamps installed on Norelco Universal 70/35mm projectors. Shown in the booth is Roy W. Mitchell, Sr. Literature on this type of equipment will be sent to any reader addressing a request to the Strong Electric Corp., 10 City Park Ave., Toledo 1, Ohio.

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is in the direction of either transforming existing auditoriums or designing new ones for one specific long term purpose, and to include if economically necessary the built-in physical ability to adapt to another usage.

I would roughly break these usages into three very general types.

1. The small intimate theatre for legitimate productions.
2. The exhibition of musical comedies and opera.
3. The exhibition of the full symphony orchestra.

I feel that each of these types deserve separate design solutions and that it is not practically possible to design a theatre to house all of these usages successfully.

In Detroit the Fisher Brothers listened to these facts and agreed to design of a new theatre to house the showing of legitimate productions that primarily would not require actor voice reinforcement but with the ability to reinforce if required by certain productions. Secondarily, if practical, the ability to add seating for the not so acoustically critical musical comedy productions.

Basically this meant the creation of a complete new theatre within the confines of the old 8 story high theatre built in 1926 as part of the Fisher Building. Our design analysis is as follows:

1. That the practical maximum number of seats for dramatic shows be no more than 1,600 and not less 1,500 thus establishing the economics to operate successfully. Patrons to be as near the production as would be possible.
2. That all seats have excellent sight lines.
3. That the most versatile stage equipment be provided to fit any kind of a production, and the best in voice sound reinforcement and sound effects be engineered to accommodate all types of productions.
4. That spacious lobby areas be created far beyond that of any existing legitimate theatre.
5. That the decor be warm, formal and create a restful atmosphere as the background for exhibition of legitimate stage productions.
6. That adequate parking facilities be provided adjacent to the theatre.
7. That personal comfort facilities involving air conditioning, lounges and seating be provided.

Although somewhat hampered by certain existing structural conditions, we were able to develop an ingenious "sight line" section by designing a new steep pitch auditorium floor, together with a complete new horse shoe mezzanine circle. The existing balcony was changed to bring seats closer to the new stage. This placed all seats in the orchestra and mezzanine within 82 feet of the curtain line, and the last row of the front balcony within 92 feet of the curtain line when used for legitimate showings.

The theatre has 1,222 seats on the orchestra and mezzanine levels, 384 seats on the lower balcony, and to accomplish additional seating for musical comedies an additional 475 seats can be added to the balcony when required for musical comedies. This phenomenon is accomplished through the use of a vertical lift, completely motor operated open type grillage screen wall which disappears into the ceiling when the larger capacity is required.

One feature of versatility is an adjustable proscenium opening by the use of permanent sliding side stage panels allowing an adjustment of 40 ft. to 54 ft., so important to the dramatic theatre.

Developed in the plan were lobby and circulating areas of 17,000 sq. ft. which creates a unique ratio to total as compared to 8,100 sq. ft. in the orchestra seating area. This accomplishes a "between the acts" spaciousness surpassing the largest of continental music halls and certainly greater than any legitimate theatre in the world, which urged Time Magazine to say "The new theatre cost $3,500,000, has a lobby big enough for tennis matches."

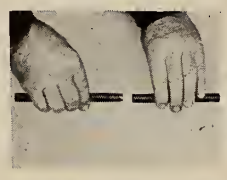
During the development of plans one of the Fisher Brothers emphatically said, "Mr. Rapp, when I enter this new theatre I want to feel that I need to be wearing a tuxedo". (He then promptly left for Florida for a long stay.)

This challenge was worrisome, but we were gratified that when he returned from Florida he showed up the next night at the opening without tux but in tails—meaning to us "mission more than accomplished".

To make the Fisher picture complete, parking facilities were increased adjacent to the Theatre to allow one car for every three patrons.

To the previously mentioned three general types of theatres, the medium of exhibiting motion pictures should be common to all. In the Fisher a vertically flown 50 ft. wide screen is permanently stored over-

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head in front of the proscenium arch and drops down when needed —thus allowing hard ticket showings of spectacular presentations during the summer months. Projection and sound equipment was provided for 35 mm wide screen - 35 mm Cinemascope and 70 mm pictures.

We are proud of our efforts on the Fisher Theatre, but it is a job well done due greatly to the cooperation and technical direction by the equipment dealers and manufacturers.

As obvious as this goal of successful merchandising may seem to so many people, it takes highly qualified talent to correlate varied atmospheres required around the highly technical equipment facets that are contained in theatres or auditoriums of various types.

Our most successful jobs have developed with the help of a team of the technical personnel from your ranks, and these jobs are particularly successful when all of the equipment clears through the architect whose concept of the whole design allows him to place these units into the construction to do their best and most efficient job.

It is apparent to all of us that an upsurge in renovating old theatres and the building of new is recognizable, and although the Fisher Theatre is an exception in that it is lavish in concept, it may initiate a trend to build privately owned new theatres to contain versatile sources of income.

During the last 25 years show business in theatres has had a rough time, and has weathered the pressures of television and many more expanding recreational activities. However, I feel that better movies will increasingly continue to attract patrons and that the expansion of dramatic production is on the move.

I predict that the building of new future theatre centers will contain versatility of exhibition either in single or multiple theatre units, and located not in but near downtown metropolitan areas with facilities that recognize this automobile age.

iP

Paul W. Vittum Awarded Herbert Kalmus Medal

NEW YORK — The Herbert T. Kalmus Award, presented annually by the Society of Motion Picture and Television Engineers, has been awarded to Paul W. Vittum, head of the color photography division of the Eastman Kodak Research Laboratories in Rochester, N. Y.

The presentation to Dr. Vittum will take place Oct. 23 during the SMPTE's 92nd semiannual convention at the Drake Hotel in Chicago.

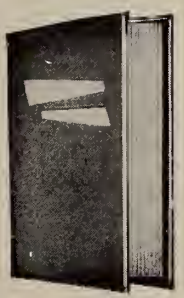
The Kalmus Medal recognizes outstanding contributions in the development of color films, processes, techniques, or equipment useful in making color motion pictures for theatre or television use.

During his long association with Eastman Kodak, Dr. Vittum has contributed to the development of Kodachrome, Kodacolor, Ektachrome, Ektacolor, and Eastman color materials.

iP



How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise — how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

ELECTRICAL NOISE

270 pages, 6 x 9
105 illustrations
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By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

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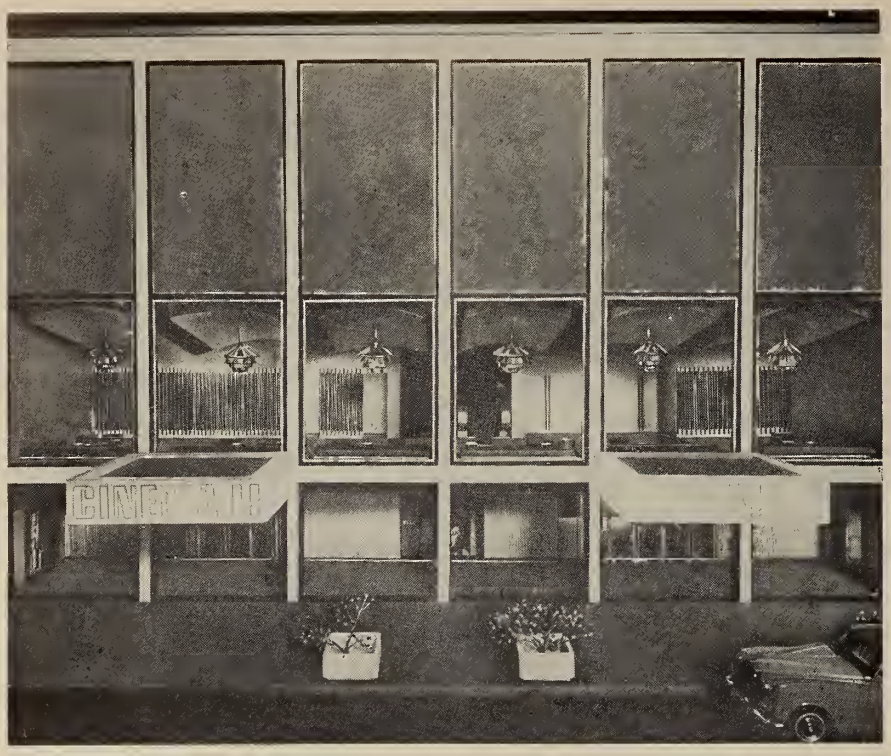
1. General Properties of Noise
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3. Distribution of Magnitudes in Noise Sources
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306 Asks Deluxe Booth Scales If Off-B'way Runs Day & Date

NEW YORK—Due to the changing distribution pattern in New York, led by United Artists' announcement that off-Broadway theatres could bid for "The Road to Hong Kong" and a list of forthcoming UA releases for runs day and date with Broadway's deluxe houses, IATSE Local 306 has notified circuits and independent theatres that booth scales will be similar to the Broadway and art houses when they play the picture simultaneously with the showcases.

The notification said "the booth cost provided for in the contract between you and this union is not applicable for and was not intended to be applicable for such exhibition and that should any of your theatres exhibit such releases day and date with Broadway or day and date with the so-called art theatres in lieu of simultaneous run with Broadway or if exhibited in the metropolitan area by-passing Broadway, the booth cost in such theatre or theatres will be the same as in the Broadway deluxe theatres."

The union's wired message to exhibitors operating off-Broadway theatres quickly followed UA's announcement of its radically changed distribution pattern. Implicit in the notice was the warning of any other company or producer following a similar policy the deluxe scales would obtain for any A class feature "whether day and date with Broadway or not." **iP**

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140 U. S. Theatres Equipped With Norelco's 70/35mm Units

NEW YORK—Niels Tuxen, general manager of the motion picture equipment division of the North American Philips Co., has announced seven new installations of the Norelco Universal 70/35mm.

Two installations are at drive-ins —the Thunderbird Drive-In at Atlanta, Ga., and the Cranston Auto Theatre in Cranston, R.I.

Four walled theatres which bought the Norelco 70/35mm Projectors include the Astor Theatre, Omaha, Neb.; Stanley Warner Fabian Theatre, Paterson, N.J.; Skouras Route 59 Theatre, Nanuet, N.Y., and the Terrace Theatre, Kivonia, Mich. The seventh installation was at the 20th Century's Deluxe Labs in Hollywood, Calif.

Tuxen said that the new installations bring 140 installations in theatres in the U.S. of the Norelco Universal 70/35mm Projector. **iP**

Joins Reevesound

LONG ISLAND CITY, N. Y. — David Pollan, who headed the design group which developed the motion picture optical devices used at the Federal Science Pavilion in Seattle, has joined Reevesound Co. Fifty projection-sound systems at the World's Fair were designed by Reevesound.

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VOLUME 37 NUMBER 10

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Back in 1940 Strong advertising stated that the Utility 1 KW lamp delivered all the light required for most screens. (Many were only 20 feet wide then, remember)?

Well, Strong still makes the Utility, as good a lamp as ever for small theatres. But, as theatres enlarged their screens, Strong constantly developed more powerful lamps so as to maintain desirable screen brightness. These lamps also continue to be made for use with screens of limited size.

Today, topping the line of six lamps for drive-ins and eight for indoor theatres, is the Jetarc, most powerful projection lamp produced to date, with a light output twice that of any other lamp.

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Volume 37 October, 1962 No. 10

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INTERNATIONAL PROJECTIONIST, published monthly by the Internationol Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesoto. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND ond ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per yeor and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed orticles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

The Show Must Go On

At a recent preview screening of a star-studded feature, for a few seconds the sound went blank and the invited audience cried to the booth to get the sound on.

The tradition of the theatre is that the show must go on. That makes the audience impatient with interruptions (even a non-paying audience).

Many film houses are not well equipped with spare parts, and many have well-worn projectors and outmoded sound systems, so the projectionist in such a theatre must do the best he can. At the poorly equipped theatre as well as the up-to-snuff booths, the able craftsman, who knows the equipment he works with, doesn't panic when something goes wrong with his equipment. But the craftsman in the poorly equipped houses has to call on his resources to get the show on the screen.

And he's ready for the emergency by checking the projectors, the sound system and all the related machines, contacts and switches. He has a detailed plan of the connections, inputs and outputs on each piece of the equipment in the booth—in other words a chart of the theatre's "life lines".

Some chief projectionists at showcase houses, where they have much emergency equipment and a big inventory of spares, have a rehearsal for emergencies, with the crew timed in making corrections in switching to the emergency sound amplifier, generator or rectifier; where to reach for the spare or the needed correction to get the show back on screen quickly. In the drill the crew checks the main fuses, sound and all emergency equipment, inventory of spare parts, etc.

Of course, when the crew has experience in the theatre's booth, they take it in stride when the machines falter—they know the weakness of their equipment. But when a new projectionist comes into the booth, even if he is an expert craftsman, he's working with strange equipment and he needs help from fellow projectionists who have lived with and know the peculiarities of the booth's machines.

The New Arc Lamp

Are screens too large for the lamps being used?

C. S. Ashcraft, president of the Ashcraft Manufacturing Co., whose history goes back a long way as a specialist about motion picture projection, says "yes" to that question—and has radically changed the lighting system for his Mor-Lite arc lamp for the theatre with 200 to 1.000 seating capacities.

In his new invention—he was helped in designing the new lamp by his son, C. S. (Bud) Ashcraft, Jr. — tests have proved that the low-wattage lamp gives 50% to 80% more light on the screen, with a 30% saving in carbon consumption, according to the Ashcraft Co.

An article about the Mor-Lite Lamp is in this issue. However, the theatre owner doesn't realize when he increases the screen area by as much as 50% without putting in new lamps there is considerable reduction in screen illumination—as a matter of fact the screen will be one-fourth as bright. So the advice of the projectionist about changing the lamps goes unheard. So maybe the projectionist has a point there when he tells the exhibitor about the carbon savings. iP

Frank Cooley

INTERNATIONAL PROJECTIONIST

Volume 37 October, 1962 Number 10

More Light at Lower Carbon Consumption Claimed for Ashcraft's Core-Lite Lamp

NEW YORK—C. S. Ashcraft Manufacturing Co. has developed a new arc lamp. Named the Core-Lite, it uses a unique optical system with a flexible mirror, with 11-mm black rotating positive carbon and 5/16-inch or 11/32-inch copper-coated negative carbon. According to the company's announcement, tests have proved that it is now possible to increase light distribution from about 60% up to 100%, with about 30% less cost in carbon consumption.

One of the Core-Lite's prime features is a flexible mirror; with the mirror spot adjusted smaller, the cone of light at the aperture is larger and when the mirror spot is larger the cone of light at the aperture becomes smaller. "It is thus possible to completely cover the aperture with converging rays of pure white light, completely eliminating the brown and blue rays which very often pass through the aperture with more conventional systems," Ashcraft states.

"The Core-Lite is designed to produce an average of 80% to 85% light distribution on the screen, and with the carbon arc pushed forward as little as 1/1600 of an inch the light distribution can be increased to from 90% to 100%.

"It has been known for years that the uncoated carbon burns with colored rays of light, mostly brown, yellow and blue. The core, made of gerium, with some carbon powder, burns with a pure white light with the qualities of sunlight. It is the ability of the Core-Lite lamp to permit only the white light to be gathered by the reflector and focused on the aperture, through the moving film, through the projector lens and thence to the screen through conversing rays of light, rather than through presently used diverging rays, that makes the Core-Lite an uncannily efficient piece of theatre equipment.



INTRODUCTION—At the New York-New Jersey meeting at Kiamisha Lake, N. Y., exhibitors and projectionists for the first time saw the new Ashcraft Core-Lite arc lamp. In the illustration above, left to right, are Allen Smith and Art Baldwin of National Theatre Supply Co., and C. S. Ashcraft, Jr.

"Aside from the light distribution assets of the new arc lamp, its greatly reduced cost of operation will appeal to theatre owners.

"The Core-Lite has been designed to replace the Suprex-type arc lamp which has been used for many years in theatres with a seating capacity from 200 to about 1,000.

"Another asset of the Core-Lite is that since heat follows light distribution, the new lamp distributes completely even heat on every millimeter of the moving film, eliminating embossive damage to film, change of focus and other ills directly attributable to uneven distribution of light at the aperture, which has plagued operators of projection machines since the advent of larger screens requiring greater light.

"While presently used arc lamps throw only 60% of arc light into the center of the moving film, the Core-Lite puts a full 100% of light, evenly distributed, on the moving film at the aperture."

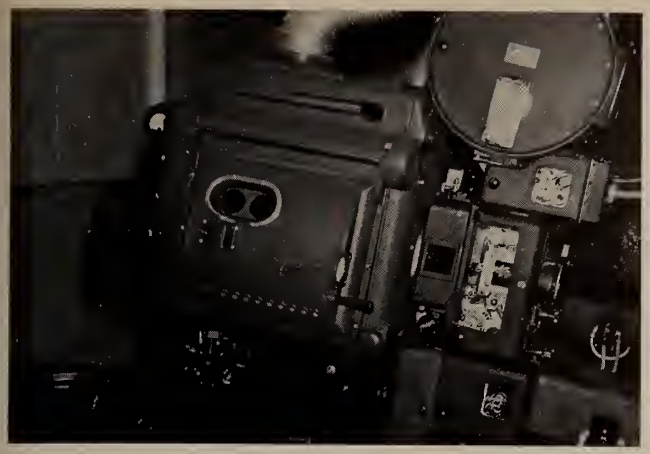
The C. S. Ashcraft Co.'s factory in Long Island City, N. Y., is working at full capacity to produce the new Core-Lite orders in addition to the company's other line of arc lamps.

The Core-Lite is being distributed by National Theatre Supply Co. and other recognized theatre supply dealers throughout the country.

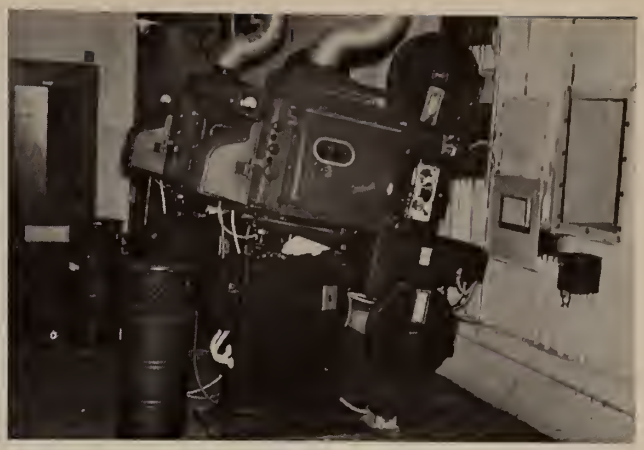
John Currie, vice president of National Theatre Supply, who is now in charge of the Core-Lite program, has assigned Allen Smith, a veteran of 35 years in the projection field, to supervise sales and technical installations for the new Core-Lite lamp.

The first demonstration for exhibitors of the Core-Lite took place at the recent meeting of New York and New Jersey, units of Allied, at Kiamesha Lake, N.Y. C. S. Ashcraft Jr. and Allen Smith conducted the demonstration.

Another demonstration, conducted by Bud Ashcraft and Smith, will be



A CLOSE-UP of the C. S. Ashcraft Co.'s new Core-Lite arc lamp as it will be presented to the N. Y. State Motion Picture Projectionists.



A THEATRE installation shows the new Ashcraft Core-Lites mounted on Simplex X-L projectors. More screen light, less carbon use is claimed.

at the New York State Association of Motion Picture Projectionists at its fall meeting Oct. 29 in Rochester, N. Y.

It will be exhibited at the C. S. Ashcraft company's booth at the TOA convention at Miami in November and at the Allied-TESMA-TEDA trade show at Cleveland in December.

Bud Ashcraft, who helped his father with the invention of the Core-Lite lamp, said at the demonstration at Lake Kiamesha "today's photography at big screen proportions demand a new and radical improvements in projection lamps to adequately light the screen so the patron can see all of the picture exactly as it was photographed. The Core-Lite lamp is particularly needed in indoor theatres using Suprex copper coated carbons as well as theatres equipped with lamps using 9-mm and 10-mm black high-intensity carbons." **iP**

Experts to Recommend Format For Improved 8mm Sound Film

NEW YORK—A committee composed of 24 experts in all phases of motion picture communications has been appointed by the Society of Motion Picture and Television Engineers to develop and recommend a format for 8mm sound film.

SMPTE set up the committee to study present and proposed small film formats. The committee will report back to the Society on the available systems which suit the purposes of business, education and other possible users of small format films.

Dr. Deane R. White, engineering vice president of SMPTE, announced the formation of the ad hoc committee. Other SMPTE engineering committees have established more than 100 internationally recognized standards for motion picture film and equipment during recent years. These engineering committees have been largely responsible for the international standardization of the motion picture industry. This standardization of product and equipment has greatly accelerated the usability of motion pictures in communications.

Business and educational leaders became interested in the use of 8mm film in 1959 when several manufacturers marketed sound projectors for small film. It appears that these projectors might give users an opportunity greatly to reduce the cost of prints for broad release of motion pictures with sound. It appeared, too, that they offered the possibility to economize on film shipping and storing costs. And, finally, it appeared that they might present a more convenient way for salesmen and/or teachers to utilize motion pictures in person-to-person relationships.

A number of companies took advantage of the new opportunity by releasing sales, training, customer relations and public relations films in small format.

However, some potential users of the small sound film format have taken a wait-and-see attitude. The new communications medium promises great opportunities for them. However, they are hesitant to invest in projectors and prints which might not prove to have universal acceptance.

Members of the committee were chosen from among the leading authorities representing equipment and film manufacturers, processing laboratories, producers and users of small format films. The chairman is Professor Louis Forsdale of Teachers College, Columbia University, New York City. **iP**

S.O.S. Buys Equipment Stock of Paramount News

NEW YORK—S. O. S. Photo-Cine Optics, Inc., has purchased from Paramount Pictures Corp. the entire equipment inventory of Paramount News, which has discontinued operations.

Included in the inventory was over 100 35-mm cameras, and hundreds of lenses. The transaction is said to involve over $500,000 in original equipment cost to Paramount News.

Among the cameras are Bell & Howell standards, Bell & Howell Eyemo Spider Turret, Eyemo Compact Turret, Westrex Akeley Sound and Silent, Mitchell silent, Wall sound, Debrie standard and DeVry silent.

Lenses in focal lengths ranging through 24-mm and up to 500-mm telephoto were acquired in the purchase, and such makes as Bausch & Lomb Balter, Taylor Hobson Cooke, Carl Zeiss, Dallmeyer, Astro, Goerz, Kinoptik, Hugo Mayer, Krauss, Schneider and Zeiss Tessar.

Most of the equipment is earmarked for the newly expanded S. O. S. rental department.

President J. A. Tanney of S. O. S. states "this acquisition now gives us the largest supply of cameras, lenses, recording amplifiers, magazines, tripods, motors and microphones in New York City. Any film maker can now be supplied at a moment's notice." **iP**

New Film Standards Needed For Improved Presentation

By ROBERT A. MITCHELL

STANDARDS pertaining to the dimensions, frame pull-down, and perforations of motion-picture film stock of all gauges have attained a high grade of exactitude. What is especially important, film standards developed largely by American professional societies have attained an international status, and are recognized by film and equipment manufacturers all over the world.

IP frequently receives requests for standards information from foreign manufacturers; and in honoring these requests we are merely relaying the proposals and agreements developed by the Academy of Motion Picture Arts and Sciences, the Society of Motion Picture and Television Engineers, and the American Standards Assn. And these organizations, we hasten to add, have been greatly assisted in their important standardization work by the valuable co-operation of the Eastman Kodak Co., the world's leading producer of motion-picture film stock of every conceivable type and size.

Aside from the fact that unanimous agreement has yet to be reached by all countries on such minor matters as perforation shape and pitch, negative shrinkage compensations, etc., a more complete degree of concord exists internationally for film standards than for the gauge of railroad tracks or for the field frequencies and scanning specification of television. This is a most gratifying state of affairs, inasmuch as the film is a truly international art form and an indispensable medium of people-to-people understanding.

In spite of the acceptance everywhere of useful and intelligently developed film standards, we nevertheless cannot forbear expressing grave doubts anent the suitability of certain basic standards which became established many years prior to certain changes in projection technique which have transformed them into a burden to the film-using industries. Then, too, certain gauges of film, notably the 16-mm size, are now widely used for purposes other than those for which they were originally intended.

These we wish to point out in a spirit of constructive criticism, and with the sure conviction that the projection process can be improved in quality by specific changes in film standardization, and its operation made more convenient and economical.

Genesis of 16-mm Film

The case of 16-mm film is so striking in this respect that it is worthwhile to consider the handicaps under which *present 16-mm standards* place the professional user of this gauge, particularly in the television field.

Sixteen-millimeter film was not designed for commercial applications. It was placed on the market for amateur movie-making and as a safe and space-saving substitute for 35-mm nitrate film, dangerous and bulky, in the educational field. The dimensional and perforation specifications of 16-mm film were admittedly well suited to its *intended* uses, but in certain important ways they are seriously detrimental to picture quality and print life in such rigorous commercial applications as TV broadcasting. These commercial applications, a commonplace today, were unforseen in 1923 when the specifications for 16-mm film were laid down.

The manufacture of narrow-gauge film for home-movie purposes by slitting unperforated 35-mm stock down the middle was considered before the use of the 16-mm width was finally decided upon. Indeed, 17½-mm was actually used to some extent in Europe. This gauge was rejected in the U. S. to prevent the use of explosively inflammable nitrate film in the home, it being wisely decided that all narrow-gauge film be made of non-inflammable base (acetate).

In order to avoid the nuisance of misframes in home movies and to eliminate the need for complex framing

A Scene From America's Projector Carbon Center...



"National" projector carbons receiving straightness test

"We pay this inspector a premium to be sure you get only straight projector carbons"

says JIM NAUGHTON
National Carbon Sales Engineer



Jim Naughton

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Fig. 1

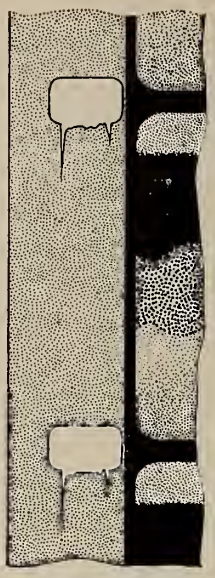


Fig. 2

FIG. 1—Silent 16-mm film has one perforation per frame in each margin. One whole row of perforations was lost when the soundtrack was added to this gauge of film. A single pulldown perforation per frame is not adequate for gruelling commercial use, as in TV.

FIG. 2—Perforation damage common in 16-mm prints. The claw of the intermittent shuttle, acting only upon one or two perforations, causes this damage. Jumpy, weaving pictures are the result. The 7-to-1 pulldown ratio used in most TV projectors is especially murderous to 16-mm prints.

arrangements in non-professional projectors, 16-mm film was perforated with only one sprocket hole per frame in each margin. (All movies were silent in 1923.) But even though these specifications were a benefit to the home-movie enthusiast, they were later to prove detrimental in then-unforeseen commercial applicatons.

16-mm Perfs N. G. for TV

The addition of optical sound to 16-mm films opened the door to physical difficulties by replacing one row of perforations with a soundtrack, thus reducing the total number of perforations by one-half. Of course, the shuttle-claw intermittent used in most 16-mm projectors acted only upon the sprocket holes in one margin, anyway; but the loss of one perforation margin was later to prove a handicap to the more expensive 16-mm projectors employing sprocket-type intermittents for more rocksteady projection and longer film life.

The unsuitability of 16-mm film perforated in the present manner is most painfully evident on the picture tube of the home TV receiver. Commercial television in the U. S. is the largest consumer of 16-mm stock, as film releases to local TV stations are in this gauge. Unlike the non-professional user of narrow-gauge film, but like the theatre-film industry, the TV industry strives for maximum usage from its release prints.

With the intermittent travel of the film in the projector gate accomplished by a claw pulling on one or two perforations on one side of the film only, wear of the perforations is rapid. This is why the projection of used 16-mm prints is so annoyingly unsteady, the picture rocking and weaving to a degree never encountered in 35-mm projection. This defect cries out for correction.

It should have been apparent to all technicians that 16-mm film *perforated with only one hole per frame* is not suitable for gruelling professional use requiring the repeated projection of release prints. The rocksteadiness of 16-mm images would be much improved *if the film were perforated with two holes per frame*, and the usual claw intermittents made with 3, 4, or 5 claws on the shuttle. Preferably, sprocket intermittents should be used in heavy-duty 16-mm TV projectors, as these are less noisy, more rugged and dependable, and very much more gentle to the film perforations.

Twofold Benefit of Double Perfs

As it happens, 16-mm raw stock having two sprocket holes per frame is already manufactured. It is used in 8-mm home-movie cameras, and it slit along the middle, after processing, to separate the two 8-mm strips photographed on the 16-mm film. If one row of perforations were omitted to provide space for the standard 16-mm soundtrack, this stock (with black-and-white positive emulsion) would be eminently satisfactory for professional 16-mm projection provided that the intermittent shuttles and sprockets of the projectors be modified to utilize fully the extra perforations.

Why hasn't this been done? Why do TV film engineers continue to drag their feet when so small a change in 16-mm film would be a positive benefit? TV can certainly stand technical improvements of this kind as well as along other lines. And I am sure that Eastman Kodak, Ansco, and DuPont would be happy to supply 16-mm films perforated with two sprocket holes per frame along one edge.

If such stock were adopted by the TV industry, the projectors in TV studios should be fitted with new claw shuttles and sprockets having twice as many teeth as those now used. The cost would be trifling. Old single-perforated 16-mm films could easily be brought up-to-date, and at negligible cost, by running them through a perforating machine. Furthermore, double-perforated 16-mm prints could still be used in unmodified 16-mm projectors, though this should be discouraged in the interests of picture quality and print life.

The benefit to the TV industry of double-perforated 16-mm film would be twofold. The pictures would be steadier and the prints would last longer, giving better quality images. It would then take an expert to tell the difference between 16-mm and 35-mm on TV (provided that the 16-mm prints were made from 35-mm negatives). TV film workers and projectionists would have to guard against misframes in splicing and in threading, of course; but this extra precaution should not upset them too much. Professional theatre projectionists seldom get misframes on the screen even though 35-mm film has four possible registration positions, and 70-mm film five!

No one can logically quarrel with the potential image and sound quality of black-and-white 16-mm prints. The grain size of positive print stock is so small that it is barely noticeable even in 8-mm projection. The graininess of motion-picture images is determined by the grain size and area of the camera negative or reversal original, not by the positive print stock. For maximum image quality, therefore, it is absolutely necessary to prepare 16-mm and other narrow-gauge prints from 35-mm camera negatives.

The trend towerd the use of 8-mm films with magnetic soundtracks by local TV stations, at least for locally photographed topical films, seems to be fraught with risk to the quality of TV images. The attraction of 8-mm stock



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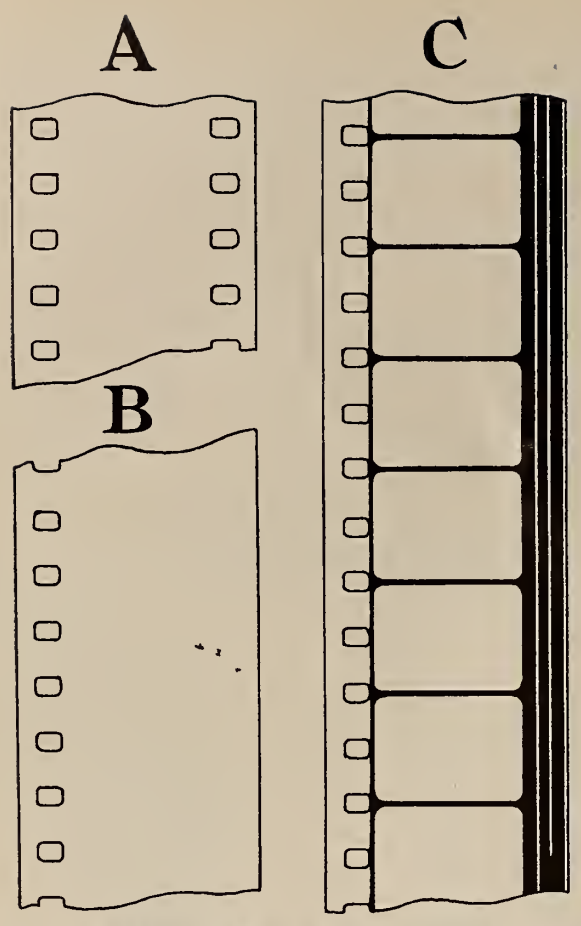


FIG. 3—A suggested change in the perforating of 16-mm film to minimize film damage, increase print life, and give steadier images. The type of 16-mm film shown in A is already made as a "double-8" millimeter film for home-movie cameras. If one row of perforations were omitted, as in B, a 2-hole-per-frame 16-mm film would be obtained. This, shown in C with blank camera frames and an unmodulated soundtrack, is urged for commercial 16-mm use.

is, of course, its relatively low cost and conveniently small size.

35-mm Film by Edison, Dickson

It is worth remembering that many early film standards of a basic nature were changed when the need arose. Turning to theatrical 35-mm film, we encounter many standards initiated at a very early date, and which have withstood the test of time and universal use. Among these are the width of standard film and the manner of peforating it. Both standards stem directly from Thomas Alva Edison and his able laboratory assistant, William Kennedy Laurie Dickson.

Edison and Dickson chose a film width of 35 millimeters, a frame pulldown of ¾-inch (establishing the 3:4-proportioned frame which was standard in theatre practice until the early 1950's), and they perforated their celluloid film, supplied by George Eastman, with four sprocket holes per frame in each margin. All these things go back to the developmental years before 1890, and none have ever been changed except the size of the perforations in the single case of CinemaScope film.

Other early pioneers in the art of cinemaography and projection leaned heavily upon the Edison-Dickson standards because of the availability of Edison Kinetoscope "peep-show" films. There were many early attempts to introduce other film widths and frame aspect ratios, but the Edison film prevailed as the model for the films of most other movie pioneers.

It was decided as early as 1894 by the Lumiére brothers of France, however, that Edison's exposure rate of 48 or 50 frames per second was needlessly fast and wasteful of precious film for projection purposes. Accordingly, the Lumiéres reduced the rate to 16 frames per second; and this speed remained the international standard until the adoption of sound in 1928-1929.

Although Edison's film width of 35-mm was retained, the Lumiéres reduced the number of perforations per frame from Edison's four on each side to one, very much like silent 16-mm film. The Lumiére perforation was circular; but a single rectangular perforation per frame in each margin persisted for many years in negative stock for use in certain makes of cameras. David Wark Griffith's negatives have this type of perforation, but were printed on positive release stock having the regular four holes per frame.

A year or two later (about 1895) Oskar Messter, the famous German film pioneer, combined the Lumiére frame rate of 16 per second with the Edison-Dickson film specifications and manner of perforating the stock. Messter also introduced the geneva intermittent, the takeup reel, the projection arclamp, and other features which, in improved form, are still integral components of the theatre projector.

The Messter film (based on Edison and Lumiére standards) became the international standard for the 30-year era of silent movies when the dramatic eloquence of the screen was the pure poetry of motion accompanied by the myriad organ voices of the "Mighty Wurlitzer."

Stepped-Up Frame Rate for Sound

The 35-mm standards of the talkless motion picture firmly established, the advent of sound changed very little. Even the very earliest silent films can still be run in theatre projectors—it is only necessary to use an aperture dimensioned for the full silent frame and to slow the machines down to a speed of 16 frames a second. Silent movies shown at the standard sound speed of 24 frames a second move much too fast.

The foregoing indicates the changes in film standards made when sound came in. The size of the frames (and projector apertures) was reduced very slightly and shifted to one side to accommodate the soundtrack, which is 1/10 of an inch wide. The frame rate was increased from 16 to 24 exposures per second. The change in the frame rate was made, not so much to reduce projector-shutter flicker and render the motion smoother, but to obtain a higher linear speed of film travel in the interests of sound recording. If modern methods of recording had been available in the late 1920's, film speed would probably never have been changed.

The need is now imperative for another increase in the frame rate. Instead of 24 frames a second, it should be 30 or 32 frames a second to eliminate flicker, reduce heating and buckling of the film, and to make rapid motion in the pictures smoother and more lifelike. As a matter of fact(a rate of 30 per second was advantageously employed in the first few Todd-AO 70-mm productions. Later wide-film practice has unfortunately returned to the 24-per-second rate to facilitate the preparation of standard 35-mm versions of 70-mm productions for theatres not having wide-film equipment. This was a serious mistake.

Every projectionist from Madawaska, Maine, to Corpus Christi, Texas, knows full well that live or taped TV is superior to filmed pictures with regard to absence of flicker and smoothness of the depicted motion. And they are justifiably ashamed of an industry that knowingly keeps

(Please turn to page 17)

Projectionist Profile...

Work by Such Pioneers as Harry Mackler Aided Present Status of Projectionists

It took a lot of spadework, brains and courage of dedicated pioneers to achieve the present status of the theatre projectionist and his unions.

It didn't come by chance, but by hard work of such veterans as Harry Mackler, who started his career as a machine operator in 1906 at a theatre in New York's Bowery. His pay then was $12 per week for 10 hours work per day seven days a week, with no time off for lunch.

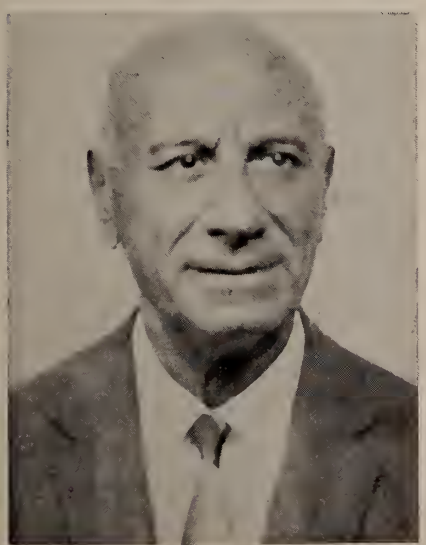
Harry was instrumental in helping to organize the first projectionists union in 1908, named the Theatrical Electrical Calcium Picture and Pro- ing Machine Operators of New York & Vicinity. Included with others who assisted in organization were Robert Goldblatt, its first president; Joe Abrams, Robert Sanders, Morris J. Rotker, Robert Levy, James Daisy.

Those were the days when several movie houses used calcium for a light source. At the time of the Hudson-Fulton celebration, projectionists were hired to light up the parades and other events by calcium arcs. They rode on horse-drawn trucks and Mackler and his fellow projectionists induced the A.F. of L. to back up their demand that calcium lighting was theatrical and under their jurisdiction and the men got a raise in pay for the duration of the celebration.

The City of New York tried to stop Mackler from showing moving pictures in various city parks, but Harry convinced Hubert Wynkoop, then chief of the Department of Water, Gas and Electricity that calcium, there being no electricity in parks, was the only feasible light source for projecting pictures, and got the green light from Wynkoop.

In 1915, Mackler was chairman of the committee of 15 to revise the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the U.S. and Canada. The name change was ratified by the delegates of the 1913 convention.

Harry was elected president in 1923 of Local 306. He appointed a wage scale committee under the chairmanship of Morris Rotker and for the first time in the local's history the committee negotiated a two-year contract. This contract called for shifts, plus a seven-and-a-half per cent increase in the first year and a





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similar increase for the second year. The pact with theatres specified that shifts were to be noon to 6 p.m., with the other shift from 6 p.m. to midnight.

Mackler was re-elected as president of 306 and held such posts in the local as business agent, chairman of the legislative committee, chairman of the examining board. During the regime of Gov. Alfred E. Smith, when Mackler was chairman of the legislative committee, Harry together with Edgar Stewart and Rotker sponsored a law that all booths in New York state must be fire-proof, and that law was enacted by the state legislature.

During the period of turmoil in 306 in 1932, Mackler was appointed receiver by Supreme Court Justice Cottillo to help place the local on a working basis.

Harry Mackler is regarded in projectionists locals throughout the country as an experienced and wise source to consult on various problems and has a large treasure of citations. gold cards and plaques from motion picture organizations for his contributions to the film industry and the craft.

He retired from Local 306 in February 1953. In addition to being a projectionist he was associated with numerous business ventures, including the owner of the Film Renovating Corp., a service company that waxed and cleaned film, and a former executive of an insurance company.

Harry Mackler resides in his home at Roslyn Heights, Long Island, and is active in various clubs. He is affilliated with Diregо Lodge No. 30 F. & A.M., the Projectionist Square Club, The Grand Street Boys Association, the 25-30 Club—he is the only living past president of the latter—and a number of other civic and social organizations.

He is the father of four children—two of them are prominent surgeons (Dr. S. Allen Mackler, specialist on Thoric Surgery, and Dr. William Mackler, a specialist in general surgery). He is the grandfather of nine children.

Harry Mackler is known as the man who gets things done, particularly as a spokesman for the "little fellow," or as the saying goes in union parlance, the underdog or the fellow who can't speak for himself. **iP**



25-YEAR AWARD—Bill Turnbull, National Theatre Supply president, smiles approval as Jack Servies, vice president and central district manager, presents a 25-year watch to Clarence Williamson, the company's Detroit branch manager. The event was one of the highlights of the recent central district meeting held at National Theatre Supply Co.'s Tarrytown, N. Y. headquarters.

Music Hall Projectionist Wins "Purple Heart"

NEW YORK—Radio City Music Hall's roving assistant chief motion picture engineer, William Nafash, had a "tour of duty" at the Seattle World's Fair in the early summer, where he served as installation supervisor for Reevesound Co. at the Federal Science Pavilion.

Reevesound supplied 50 major systems at the Fair, including a battery of seven interlocked projectors used in the unique Charles Eames presentation "The House of Science," a film which introduces all visitors to the huge U. S. science exhibit.

During an interview in New York City, Mr. Nafash produced a white protective helmet bearing a "purple heart" which was presented upon arrival at the fair site by Reevesound president Boyce Namec for his efforts during the 1959 U. S. Exposition in Moscow.

The veteran projection engineer suffered a severe leg injury while attempting to rescue a stricken projector perched atop unfinished steel scaf-

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folding during a preview showing of the exhibit's introductory film for Soviet Premier Khrushchev and U. S. vice president Nixon. In the true spirit of the theatre, realizing that "the show must go on", he continued his duties at the six-week exhibit after having received only minor medical attention. It was for this devotion to duty that Mr. Nafash was presented his "purple heart".

Reevesound Co. designed and engineered the seven image, seven projector system for the Charles Eames production at the Moscow Exhibit. At the time of his accident, Mr. Nafash was on loan to Reevesound to supervise installation of projection and sound equipment used there by the U. S. Government.

Bill Nafash emerged from the Seattle Fair unscathed. With his "purple heart" and the jibes of companions to remind him of his Moscow venture, he successfully guided the installation and initial operation of Reevesound's projection systems including the seven interlocked 35-mm projectors which Charles Eames used to weave an unusual multiple-image tale of science on an unframed wall panel. The special projection system generates animated cartoons and still and moving photographs in brilliant color on seven "screens" of radical size and shape. The several screen areas are indicated by the projected image only, the entire wall panel being unmasked.

Personable Bill Nafash, who has been involved with motion picture projectors in one way or another for the past 26 years, is proud of his contributions to U. S. exhibits around the world. In addition to his work at Moscow and Seattle, he also participated in the installation and operation of motion picture equipment as far away as Kabul, Afghanistan, where he was a temporary staff member of the U. S. Information Agency.

Meanwhile, back at the Music Hall, he reminisced about the Seattle Fair: "I just can't understand," he said, "why the people who view 'The House of Science' film, sit on the carpet instead of standing as they are supposed to do. Evidently, the plush carpet and the quiet room affect them that way. All the time I was there, I didn't see one person stand during the show.

"Of course", he continued, "it is a dynamic adventure for a person standing or sitting." **iP**

QUARTZ IODINE FLOODLIGHT

KENILWORTH, N. J. — Stonco Electric Products Co., announced a new series of Iodine floodlights with a calibrated dial mechanism for on-the-spot beam coverage in an outdoor area, architectural and sign lighting. The vertical beam control makes it possible for on-target lighting with fewer fixtures, according to the company, since the clearly defined rectangular beam can be adjusted to fit any lighting task. **iP**

Name Changed

NEW YORK — Walter Elterman, president of Plastic Reel & Core Co. of Weehawken, N. J., has announced a change in the corporate name of his company.

The new name that the company will operate under is Plastic Reel Corp of America. The company's principial source of business is derived fro mselling plastic reels to the 8mm and 16mm return reels for the amateur field.
film and television industry and

The company is in full production on their new patented Reel-Pak and it is being met with great success, the company says. **iP**

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TV is no Problem in New Zealand; Neither is Getting People into the Theatre

By PEDER N. BLOOM

WELLINGTON, N. Z. — New Zealand, a land where the people are the second greatest movie-goers in the world, where TV is no problem, where the exhibitors share the product out fairly among themselves, where the government feels the business is so important that they include theatre tickets in the official cost of living index, the business is conducted with a conservative attitude to be expected of a group of subjects of the Queen, even if they are halfway around the world from home.

What are the facts of the industry in New Zealand? There are 547 theatres in the country, 206 of which are full time (six days a week), 298 are in operation three days a week and 43 are circuit or traveling theatres in sparsely settled areas.

There are a quarter of a million seats but only 38 theatres that have more than 1,000 seats. The average is 470. In these 547 theatres there are 155,273 performances per year. The United Nations Yearbook reports that New Zealand is second only to Ireland in per capita attendance in motion picture theatres. Ireland has 18.0, New Zealand has 16.6. The United States is 14th with 12.6 per capita attendance.

Of course, the New Zealand exhibitors have one thing going for them. Television—government owned—presents little competition for entertainment time, hence there are few sets and the government plans few improvements in programming until the medium gets more viewers. In the impasse between government-owned television officials and the stubborn public lies the secret of exhibition's success.

Even Product Split

Most theatres in New Zealand are owned by two large chains. The largest is Kerridge Theatres Ltd. and the other is Amalgamated Theatres Ltd. Independent operation is mainly city grind houses or small rural situations. In most areas of New Zealand these two chains own the only theatres in the customer area, and by agreement all first-run films are shared by the two firms. In an area where the two companies are competitive, there is an even product split. In an area where the large chain has no competitor it will show all films and where, in rare cases, the competition is an independent they will share companies equally.

There is no product shortage in New Zealand. As a matter of a fact there are too many films. Some films never get a first-run, since there are not enough theatres to take care of them. English films are as popular as American and many English stars command a larger following than many Hollywood glamour gals and boys, although Elvis Presley, Sandra Dee, and the other teen-age favorites are big here. Among the English films the "Carry On" series can always be counted upon to bring in a good box-office. Popular stars are Peter Sellars, Sid James, Richard Attenbourgh and Hayley Mills. There are three Hayley Mills films playing in downtown Auckland at the present time.

There is very little market for foreign language films with only four theatres playing them. Cinerama has one theatre in Auckland and is currently playing "Seven Wonders of the World."

No Drive-ins in N. Z.

There are no drive-in theatres in New Zealand and there will not be any in the forseeable future. In fact no one is permitted to build a theatre unless the government grants a permit and it has granted only four permits in the last six years.

One of the problems is that all the projection equipment for a new theatre must be imported and with the limit placed on overseas buying by the government as a member of the sterling bloc it is almost impossible to get new equipment and difficult to get an import license for replacement equipment.

Most theatremen, however, approve the policy of government restrictions on new houses. This limits the number of seats and prevents oversaturation of any area.

When asked the state of business a theatreman in New Zealand will say that it is slipping. The manager of the Regent theatre in Wellington quoted Arther Mayer, American industry's Boswell, who once said business has fallen off from colossal to simply spectacular. 1960 was the biggest year in the history of New Zealand theatres but 1961 was perhaps five to eight percent off the 1960 figure.

TV is beginning to rear its ugly head in the country but it is not a problem yet and is not expected to become one in the near future. There are only three stations and 17,000 sets in the entire country of 2,500,000 population. All TV is controlled by the government and they do not plan to add stations in the foreseeable future. Most programs are old American or British filmed shows of the "Bilko," "Life with the Nelsons," and "Dragnet" type.

There are no feature-length films shown on TV in New Zealand and the government telecasters have assured the industry they do not intend to show feature films on TV in competition with the theatres.

Little Night Competition

Another reason the cinema remains healthy here is because there is little competition for the entertainment shilling. It is an early-to-bed country. The pubs lock up at 6 p.m. so there are no night clubs. Dance halls offer little inducement to the older folks. Theatres get their greatest competition over the weekends when the sports-loving Kiwis play or watch cricket, rugby, sailing or horseracing. Pari-mutual and off-track betting with bookies is legal for those who want to gamble and there is a national lottery.

The better first-runs and suburban houses all operate on the American equivalent of a hard-ticket, reserved-seat policy. The grind and last-run suburbans are the exception.

When you decide where you want to sit you will pay for tickets based on location. Prices range from the equivalent of 15 cents for the front rows of the main floor to 80 cents for the best balcony or rear main floor seats.

Most theatres run two shows a day Monday through Thursday at 2 and 8. Three shows on Friday, 2, 5, and

—BUT NO POPCORN!

Sale of refreshments and screen advertising are big revenue-producers for New Zealand exhibs, and the sale of the first is conditioned on the sale of the latter. There is a 15-minute break between the opening short subjects and the feature film and patrons rush from the auditorium to the refuge of the friendly "Nibble Nook" to escape the ubiquitous Tele-Slides. Reaction to the paid screen ads is much the same as on television in America. Nibble Nooks provide candy and soda and, in some houses, tea and buns. But that big favorite of American audiences — popcorn — is not sold in the Antipodes.

8, and four shows on Saturday, the early show being at 11 a.m. Theatres usually close on Sundays, although in the large cities one or two theatres may run a Sunday matinee but in all cases it will be a revival of an older film. In the larger cities there will be one or two theatres that run a grind policy with double or triple features but there are exceptions. **iP**

"Spacearium" Hit of Seattle Exposition

SEATTLE — With the Seattle World's Fair now closing, there seems to be no question that the unqualified hit of the Century 21 Exposition was Cinerama's futuristic "Spacearium" process and film.

Audiences visiting the U.S. Science Exhibit, of which the film exhibit is a part, have been so enthusiastic about the 360° (degree) film process and its twelve-minute "Journey To The Stars" film that Cinerama officials at the Fair have been faced with the serious problem of audiences refusing to leave the theatre until they could see another screening of the tri-dimensional film.

While attendance at the fair itself might not have been up to capacity, the "Spacearium" theatre has consistently played to full houses. Standing 750 viewers at a time (There are no seats in the theatre, only handrails), the domed-screen theatre had approximately 150,000 visitors in the Fair's first two weeks.

The "Journey To The Stars" film utilizes a 7,793 sq. ft. viewing area, which encompasses the Spacearium theatre's 70-ft. in diameter, 40-ft. high all-encompassing dome. The world's largest screen accepts the projected image covering a full 360 degrees, completely encircling the audience on all sides and above.

Viewers stand behind the tiered rails which make up the interior of the theatre. A slight forward incline is provided for theatrical visibility and to help focus attention on the central point of the show, which is about 10 degrees above the horizon in the center of the screen. Although action takes place all over the domed screen, a central focal point is necessary for continuity.

At the conclusion of the Fair, Cinerama retains all rights to the new film process and equipment. **iP**

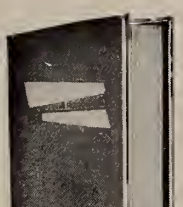
Kalart Introduces New Projectors

The KALART Co. which recently acquired Technical Service, Inc., of Farmington, Mich., announces a new line of Kalart / Victor Moviematic "Repeater" and Duolite 16mm sound projectors. These models are being marketed by the Audio-Visual division of Kalart—Victor Animatograph Corp., through its Audio-Visual dealer/distributor organization.

Moviematic "Repeater" projectors are available in five models designed for showing 16mm sound motion



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By WILLIAM R. BENNETT

Bell Telephone Laboratories, Inc. — Data Communications Consultant

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes — transistors — gas discbarge tubes—klystrons—traveling wave amplifiers—and others. Botb independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprebensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like pbenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

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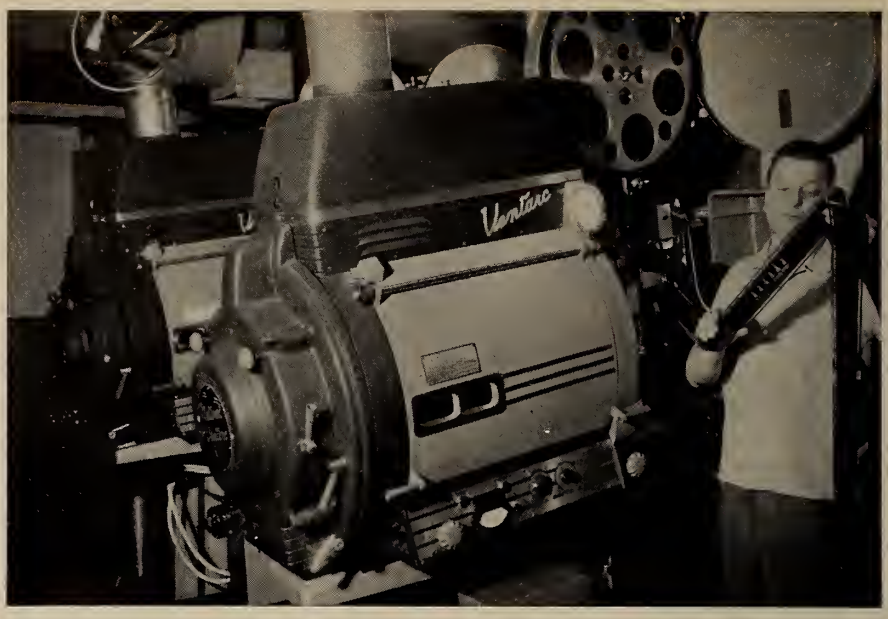
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MOVE TO 70 MM—The Cranston Auto Theatre, Cranston, R. I., recently decided to go to 70-mm projection and at the same time greatly improve the brilliance of the projected picture. Accordingly, they purchased Norelco projectors and had National Theatre Supply of Boston install Ventarc projection lamps. The result has been that the picture on their 112-foot screen is now more than twice as bright as formerly. This marked the 64th installation of "blown-arc" lamps. Shown in the projection room is Stanley Moskwa.

picture film either on their own built-in screen or a distant screen, without having to rewind the film or thread the projector for each showing. The film is loaded into a power-driven cartridge for projection in the Moviematics; however, some models permit the entire cartridge to be easily removed when it is desired to show other films on standard reels.

The Kalart/Victor Duolite Model ST-18 has all the conveniences of a conventional 16mm sound projector plus the added feature of a built-in screen for table-top use in a lighted room.

A new brochure describing the many features of these models, with a handy model selector chart, is available by writing. **iP**

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Look Around...

Radio City Staff of 500 Backs Up Projectionists

The Music Hall has a smooth-running organization, though over 500 people are in that organization. Every department head is called on to see that his charges perform their duties efficiently.

Ben Olevsky points to the phone on his desk, says: "If there's one slip-up in hte projection booth that thing will ring, and if the slip-up is serious enough, I might get fired."

The projection booth in the Music Hall is a busy place. Not only putting the show on the screen, but effects and spotlights for the stage show, orchestra and organ solo, which must be timed with the other spotlights handled by stagehands.

The booth is well supplied, has two spare projectors, sound channels, motor generators, rectifiers, etc. The projector fire traps and gates and all of the contacts on every machine are cleaned daily. The same goes for the arc lamps. The prints are rewound by hand and inspected after every run.

Olevsky inspects the prints of a new show on the screen of the Music Hall's screening room. He says he gets several prints of the new show and runs them over and he selects the choice prints.

The Music Hall for the last several years puts about 10 or 11 new shows per year. When a new show is mounted, the projectionists and all stage crew, the spotlight men, the designer of the stage show, musicians, and the whole organization are busier than busy. The final dress rehearsal takes place about 4 a.m. on Thursday morning. And several times Olevsky says, there were times when the rehearsal didn't end until a quarter of an hour before the Music Hall opened its doors to the waiting customers.

The projectionists at Radio City Music Hall have very interesting jobs, but they must be GOOD. **iP**

New Film Standards

(from page 10)

the all-important projection process in a state of technical backwardness. Now, even though minor hardships of a temporary nature may be involved, an immediate and universal change to 30 or 32 frames per second as the standard filming and projection rate should be seriously considered. The need for this type of improvement in theatre projection, we repeat, is urgent.

3-Perf 35-mm Pulldown Urged

What other beneficial changes could be made in 35-mm standardization? The dimensions of the film frame and the pulldown distance (now ¾-inch) demand attention. The present film frame was designed for a 3:4-proportioned picture *without* a soundtrack on the film. These standard frame proportions were preserved when sound came in by reducing slightly the size of camera and projector apertures. This is why the framelines on standard 35-mm soundfilm are rather thicker than those on silent film. CinemaScope prints resemble silent films in this regard.

Now that widescreen aspect ratios of 1.66/1, 1.75/1, and 1.85/1 have all but replaced the old conventional aspect ratio of 4/3 (more exactly, 1.375/1), we find that only a small part of the picture area of standard theatre release prints is actually projected, the rest being masked off by the widescreen aperture. The loss of film length from this cause is rather alarming. About one-third of the total length of a print—300 feet in a 900-foot reel—goes unshown, and yet imposes just as much of a burden on the projector gearing and intermittent movement as the projected areas.

In addition to the appalling waste of film footage, the standard 4-hole (¾-inch) frame pulldown probably results in a greater degree of vertical jump and sideweave than would be present *if the pulldown distance were reduced to 3 sprocket holes (9/16 of an inch)*. It is easier to hit a target at 300 yards than at 400 yards; and this is precisely the case with the distance of film pulldown by the intermittent movement and sprocket.

Some loss of utilized film footage due to the framelines and to the slightly smaller size of the projector aperture relative to the size of the camera aperture is inevitable. This loss amounts to only 3½% of the total length of the film in CinemaScope projection, and only 7% in 35-mm silent-film projection. Fully 15% of the film is utilized when the standard 0.825"x0.600" soundfilm aperture is used (aspect ratio (1.375/1); and this we regard as the absolute maximum linear non-utilization which good standardization practice should tolerate.

Choice of 3-Hole Pulldown Standards

Because of the general preference for widescreen aspect ratios, a pulldown of four sprocket holes (0.75-inch) is no longer necessary, or even desireable. In fact, it is very undesirable. A 3-hole pulldown (0.5625-inch) readily accommodates camera apertures measuring approximately 0.87"x0.55", and all widescreen projector apertures down to an aspect ratio of 1.65/1 (0.825"x0.500").

Since the lowest widescreen aspect ratio in use is 1.66/1, the one originally fathered by Paramount for VistaVision showings, no difficulties whatever will be encountered with *any* widescreen aperture now being used for non-anamorphic widescreen projection. No reduction of aperture size and no increase in image magnification are necessary when the 3-hole pulldown is used. And it is conceivable that a 2:1 anamorphic expansion of the 1.65/1 field to give an aspect ratio of 3.3/1 would duplicate a Cinerama-like effect in a most economical manner.

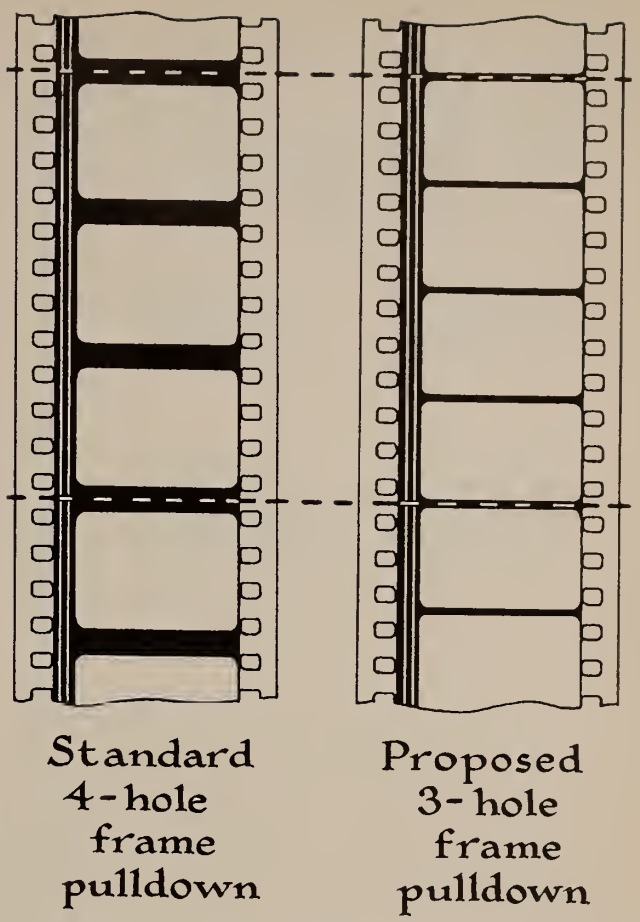


FIG. 4—Standard 35-mm film printed for a 3-perforation frame pulldown would provide 4 frames for every 3 of the present 4-perforation frame film. At the same linear speed (90 feet per minute), an exposure rate of 32 frames per second, instead of 24, would result. This would provide flickerless projection at the highest light levels, smoother motion, less heating and buckling of the film, and clearer pictures.

What about the sound? This writer would personally advocate retention of the present optical track in its present position on the film, but with magnetic stripings added to the margins outside the perforations for stereophonic sound. If this were done, the optical track would carry the center channel, and the two magnetic tracks the left and right channels. A similar proposal applicable to the present film standards was originated several years ago by our esteemed colleague, Jean Vivié of Paris, France.

The attractiveness of the 3-hole pulldown system is manifold. Only 6¼% of the total length of the film is unutilized with the lowest aspect ratio (1.65/1), no reduction in aperture size or change of projector lenses is required, reels of film will run for an appreciably longer period of time at 24 frames per second, or give exactly the same running time per reel as at present when shown at 32 frames a second.

The advantages of a higher frame rate are mentioned below: the single obvious disadvantage (temporary) of the 3-hole pulldown is the necessary drastic alteration of projector intermittent sprocket and all other sprockets with changes in gearing if sprockets of present sizes are to be retained. But it should be noted that old cameras need not be altered, and old negatives are just as usable as ever. The change in format can most easily be made in the printing of the film, producing new-format prints from old-format negatives and masters.

At 24 frames a second, 3-hole standardization would

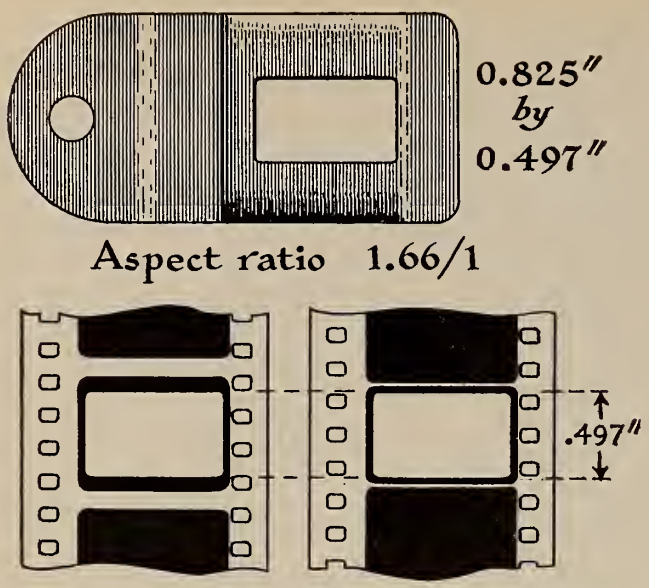


FIG. 5—The 3-hole pulldown 35-mm film accommodates all widescreen apertures down to an aspect ratio of 1.65/1. (The ones in common use are 1.66/1, 1.75/1, and 1.85/1.) There would be no need, therefore, to change presently used apertures and lenses if the 3-hole film came into use.

result in a speed of film travel of 67½ feet per minute (1⅛ ft. per sec.). Because there are 64 frames per 3 feet, the much more satisfactory 32-frames-per-second rate would result in a film speed exactly the same as that now used, namely, 90 ft. per min. (1½ ft. per sec.). Pictures would be clearer at the higher frame rate, forasmuch as heating and buckling of the film would be considerably reduced. Arclamps of the highest power would present no danger to the prints.

It so happens that a frame rate of 30 per second has been proposed in the past because it coincides with the field rate of American television. This presumes possible use on TV of films made originally for theatre presentation only. We do not consider this a valid argument for the adoption of the 30-frame rate for theatre films, and it certainly would make no impression on engineers in most foreign countries where the 50-cycle current in common use dictates a 25-per-second TV field rate.

Speaking for himself, this writer does not particularly favor degradation of the motion-picture industry by the release of theatre films to TV to be shown at late hours in an indifferent technical manner and with disgusting "commercials" to destroy the illusion the film director strove so hard to create. Let TV have its own frame rates. Ours should be chosen for their effect *in the motion-picture theatre*, and without regard for an industry which operates in direct competition with our own superior medium of audiovisual entertainment.

If 30 frames a second were chosen, however, the 3-hole pulldown would result in a film speed of 84⅜ ft. per min. (1-13/32 ft. per sec.). This is only just a trifle lower than the present standard of 90 ft. per min. at 24 frames per sec. with the 4-hole pulldown, but it has the decided advantages of smoother motion, the complete elimination of shutter flicker at high light levels, and less film heating and focus-runing film buckle and flutter. The 32 frames per sec. rate is perhaps preferable because it represents the maximum frame rate that can be used without increasing the speed of film travel beyond the 90-feet-per-minute speed used today. Moreover, at 32 frames per second all the advantages of a higher frame rate would be at their maximum—the very slight traces of flicker which some observers have detected by peripheral vision at high light levels when films are shown at 30 frames per second (Todd-AO) would tend to vanish. At this frame rate the customary 2-wing shutter would produce 64 light pulses every second.

Projector Changes for New Film

The change in projector gearing may demand a modicum of attention and ingenuity on the part of projector designers. Actually, the simple substitution of 12-tooth for 16-tooth sprockets, 18-tooth for 24-tooth sprockets, etc. would constitute a complete and satisfactory conversion. The projector-motor drive gears would have to be changed only if a frame rate lower than our recommended 32 per second is desired (e.g. either 24 or 30).

It is certainly true that 12-tooth sprockets work well, but there does exist a definite feeling among engineers against sprockets smaller than the 16-tooth size. Simple sprocket substitution might, therefore, be recommended only as a temporary measure in a crash program of conversion to the 3-hole film pulldown. For a semi-permanent conversion where cost is a factor to be reckoned with, we suggest a 12-tooth intermittent sprocket with sprocket shoe to match and a change in the drive gearing of the intermittent movement to effect the change from 24 to 32 frames per second when motor speed is left unchanged and the former regular 16-, 24-, and 32-tooth constant-speed (feed, holdback, sound, and takeup) sprockets are retained.

The suggestion that the frame pulldown distance of 35-mm motion-picture film be changed from 4 to 3 perforations has been made several times in the past, not only by this writer, but by technicians and engineers better qualified by long experience in projector building. The change is especially cogent at the present time. All producers and equipment manufacturers could be notified, a conversion date set, and all laboratories and film distributors prepared to issue prints of new pictures in the 3-hole format and given time to remake prints of old screen classics and reissues. The exhibitor will know when he *must* be prepared, either by purchasing brand-new mechanisms specially made for the 3-hole pulldown standard or by the relatively inexpensive expedient of converting his present projectors by means of kits which the projector and parts manufacturers will be able to supply. No exhibitor need feel that he is being forced into an unnecessarily exorbitant expenditure. The cost can be kept extremely low wherever necessary.

Projectionists' concern is for the quality of the image on the screen, for this is our "stock in trade", the only commodity we sell. Movies can be more lifelike—clearer, without a trace of flicker, and smoother in the reproduction of rapid motion—than they are at present. This can be done with standard 35-mm film by adopting the relatively simple changes proposed in this article—maximum benefit from a near-minimum of expense and temporary inconvenience. Why should commercial television, a shoddy medium at best, be allowed to surpass theatre movies in regard to flicker characteristics and the delineation of rapid motion? Why should such a blatantly tasteless and dramatically ineffective competitor have even a single point of technical superiority when standardization changes of a relatively easy character will enable 35-mm theatre projection to surpass TV in these few respects as it already does in image definition, uniformity of lighting, natural color, lifelike naturalness, and visually compelling size?

There is no adequate substitute for the theatre motion picture in the world of entertainment; but the industry cannot survive unless it stirs itself, exerts itself, makes an effort! This article poses a vitally important question. The times we live in demand that the motion-picture industry give an answer to this question — the right answer. **iP**

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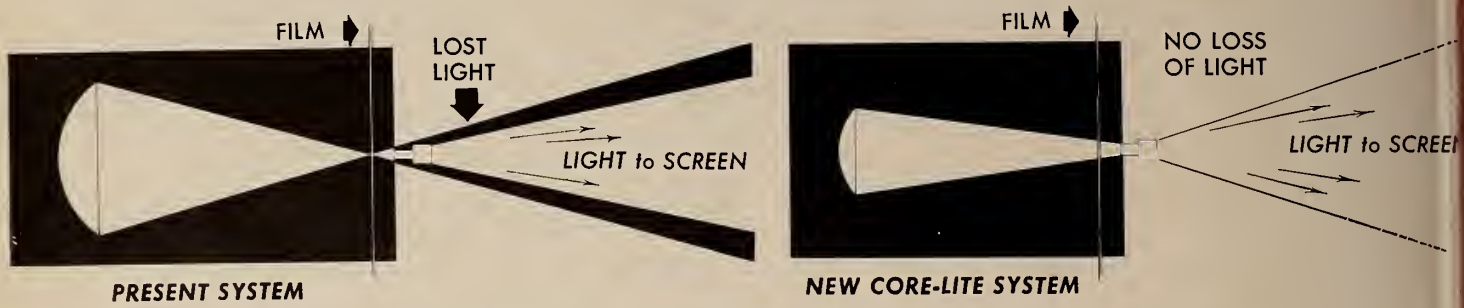
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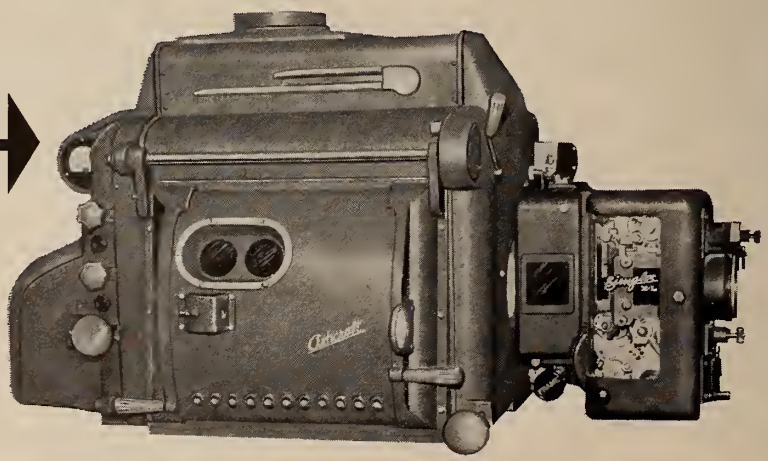
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Volume 37 November, 1962 No. 11

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co. division of The Northern Publishing Co., Post Office Box 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States, Canada, and U. S. Possessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign countries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

Trade Show to Alert Theatre Owners To New Innovations in Projection, Sound

The forthcoming convention of Allied States Assn. of Motion Picture Exhibitors holds high promise that the theatre owners will give more attention to the equipment trade show than formerly was the case at exhibitors' conventions.

Allied in cooperation with the Theatre Equipment and Supply Manufacturers Assn. (TESMA) and the Theatre Equipment Dealers Assn. (TEDA), has set up an agenda that makes this possible for the Allied Convention in Cleveland on December 3-5 at the Sheraton Hotel.

TESMA will show the latest models of theatre equipment with TEDA's members on hand to help the manufacturers to demonstrate to the theatre owners' the new booth and associated devices to screen motion pictures to their patrons at the needed high standards of present day production techniques.

This year has seen hundreds of new theatre construction, remodeling and modernization country-wide with new projectors, sound systems, screens and what is needed to make the new machines function. So if old theatres want to stay in business, they'll have to modernize, at least, their projection booth with up-to-date equipment.

And that will be a break for projectionists at old and run-down theatres.

Several months ago, the Allied, TESMA and TEDA representatives went into a huddle to make the trade show a feature of the exhibitors' convention at Cleveland, and the representatives of the three organizations will consult up to the time the convention opens to make the trade show a highlight of the meet.

Theatre equipment and its vital importance to the film industry will be given emphasis to the assembled theatre owners' at the forthcoming Allied convention.

The agenda of the convention with the business meetings, exhibitor forums and speeches will allow for the theatre owners to visit TESMA trade show.

One of the luncheons would be designated as an "equipment luncheon." The speaker at this luncheon will point out the new developments and innovations the theatre owners' can see at the trade show with its many interesting and informative exhibits.

Allied more than ever promoted the December convention in Cleveland and its trade show and the Allied national officials expect a record turnout of exhibitors at the 1962 meeting.

The spurt in new theatre construction and remodeling this year has the theatre owners equipment-minded, another favorable factor for the TESMA-TEDA trade show at the Allied Convention.

The average theatre owner is a showman who is concerned with the picture he books and whether his average patronage will suit their taste and his advertising and promotion for current and forthcoming attractions. Being a showman, he is too technical-minded and overlooks the modern techniques that the production man tries to put in his pictures and the advancements of the theatre equipment manufacturers. So when his projectionists or the local equipment dealer tries to interest him in upgrading his booth equipment he thinks the former likes the new-fangled device to work with, and the latter to put out money for the dealer to make a profitable sale.

(Continued on Page 11)

INTERNATIONAL PROJECTIONIST

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Reid H. Ray Takes Over As Motion Picture Engineers Head

New York—Reid H. Ray, president of Reid H. Ray Film Industries in St. Paul, Minn., is the new president-elect of the Society of Motion Picture and Television Engineers. Mr. Ray will succeed John W. Servies, vice president of the National Theatre Supply Co. in New York, who will become past-president of the society on Jan. 1, 1963, when the new President takes office.

Mr. Ray has been a member of the SMPTE since 1929, A fellow of the society, he is completing a two-year term of office as executive vice-president. During his membership, Mr. Ray has been active in society affairs, having served as convention vice-president, chairman of the sustaining membership committee, chairman of the inter-society liaison committee, member of the nominations committee and member of the membership committee. He has also been a member of the board of governors.

Mr. Ray received a B.S. of Commerce degree from the State University of Iowa in 1923. Since then, he has been active in the film industry in many capacities (cameraman, editor, writer, director and executive in sales and management), and has for many years, been president of the organization which bears his name.

Other officers elected in the recent mail ballot are as follows: Executive Vice-President: Ethan M. Stifle, manager, east coast division, motion picture film department, Eastman Kodak Co., New York. Editorial Vice-President: Herbert E. Farmer, faculty, University of Southern California. Convention Vice-President: George W. Colburn, president, George W. Colburn Laboratory, Highland Park, Ill. Secretary: Robert G. Hufford, physicist, motion picture film department, Eastman Kodak Company, Hollywood, Calif.

The following members were elected to the 1963 SMPTE Board of Governors: For the Eastern Region: Max Beard, chief, Photography Division, United States Naval Ordnance Laboratory, Maryland, and Joseph T. Dougherty, technical representative, E. I. du Pont de Nemours and Company, New York. For the Central Region: Kenneth M. Mason, manager, Motion Picture Film Department, Midwest Division, Eastman Kodak Co., Chicago, and James L. Wassell, director, Marketing Professional Equipment Division, Bell and Howell, Chicago, Illinois. For the Western Region: William E. Gephart, Jr., president, General Film Laboratory, California, and Ralph E. Lovell, sales engineer, The Westrex Company, California. For the Canadian Region: Roger J. Beaudry, vice-president-general manager, Pathe-DeLuxe of Canada, Limited, Toronto, Ontario.

The new officers and governors will take office Jan. 1, 1963. **iP**

Drive Seeks to Preserve Old Films

A national drive to prevent the loss of some of the most historically significant motion pictures ever produced was proposed today.

John Flory, advisor on non-theatrical films, Eastman Kodak Co., told the Society of Motion Picture and Television Engineers, convening at the Drake Hotel, that a vast program of motion picture archives is desperately needed to preserve and catalog for posterity the most significant examples of the current nationwide output of nearly 30,000 films per year.

"Many of the most historically significant motion pictures ever produced are at this moment physically decaying beyond all hope of salvage," Flory said, "and in another few decades may be lost forever unless law-makers, government authorities, well-heeled foundations and the public can be awakened to this crisis."

The motion picture and the photograph are becoming more and more significant as prime recorders of our life and times, Flory asserted. Each year there are twice as many new films being produced in the United States as there are books being published, he pointed out.

The program must be undertaken on the national, regional, state and local levels, Flory noted, and should have as its major goals:

1. Better dissemination of technical information to educate professional document archivists in the physical housekeping duties of maintaining a useful film archive.

2. A re-orientation of historians and archivists, who have been trained in the tradition of the printed word, to make them more aware of the significance of film.

3. Creation of a completely new kind of specialist—the film archivist.

"From cradle to the grave, from birth to death certificate and around the clock, photography in some form profoundly influences our lives," Flory commented.

"Whether it is an illustration in a newspaper, a Roentgenological record in a hospital, a microfilm of checks in a bank, an industrial x-ray of large and vital metal castings, a 3-D aerial photograph used by a contractor in laying out a clover-leaf, or a television program bounced from a satellite outside the earth's atmosphere—all these and thousands of other applications are contributing to a communications upheaval of which the average man is largely unaware." **iP**



Kodak Program Aids Education In Colleges

ROCHESTER, N.Y. — Under the Eastman Kodak Co.'s aid-to-education program, American colleges and universities have received a total of about $1,200,000 in contributions in 1962.

The Kodak program includes 58 direct grants, 22 research grants, special grants for 13 institutions, and a number of other contributions. The program acknowledges the importance of well-educated, well-trained young men and women in the progress of American industry.

"Kodak's program of financial aid to higher education is designed to encourage and support excellence in our colleges and universities," Dr. A. K. Chapman, chairman, and William S. Vaughn, president, said in the statement.

West Coast Theatre Gets New Sound System

HOLLYWOOD—Installation of the first all-transistorized sound system in a major West Coast theatre has been completed at the Huntington Hartford Theatre for a Hollywood premiere Dec. 18.

The transistorized system occupies less than a fifth of the space required for non-transistorized equipment.

The new Super Optica screen distributes light in a uniform pattern, horizontally and vertically, throughout the theatre, giving side seat viewers as evenly illuminated a "picture" as afforded those in center seats.

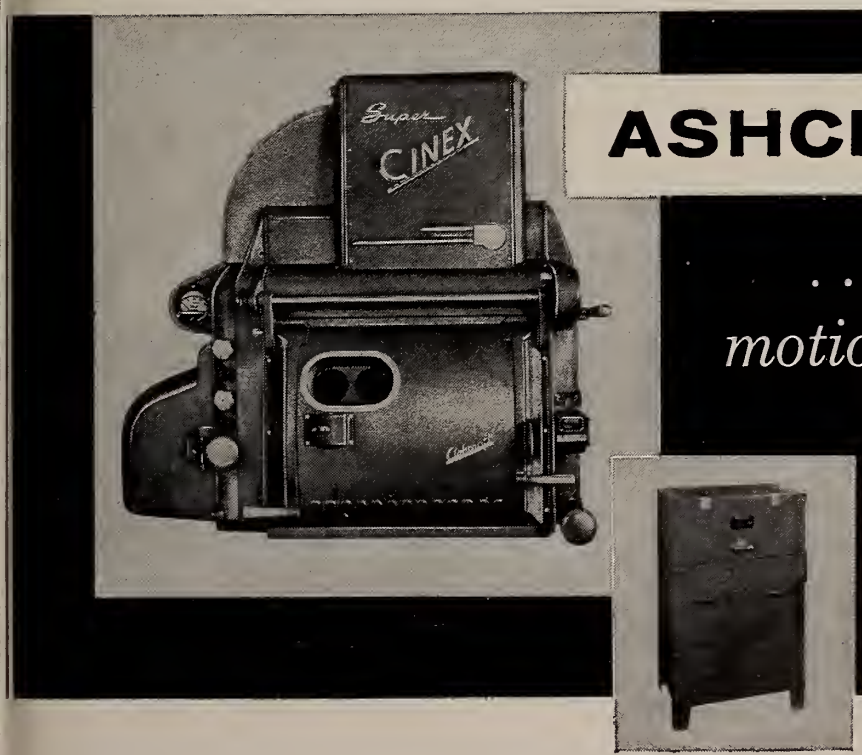
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The Projectionist's War On Fuzzy Focus

By ROBERT A. MITCHELL

THE SUDDEN deterioration of image clarity which accompanied the inception of the wide screen is still painfully apparent in a large percentage of the nation's theatres. Discouraged, many projectionists have "thrown in the sponge" and abandoned all attempts to improve unacceptable focus conditions. "It's a hopeless task," they say. But is it?

True though it is that higher powered lamps and lenses of shorter focal length are the chief causes of fuzzy focus on wide theatre screens, a number of corrective measures are available to the projectionist —measures just short of talking a skinflint theatre owner into spending money for the equipment he should have purchased years ago.

The only important factor affecting projection quality which most of us cannot change is the persistent unwillingness of too many theatre managements to meet widescreen standards by updating the projection and sound equipment. Our sympathies are with the projectionists in theatres where curved aluminum screens, oldstyle mechanisms and soundheads, inadequate lamps, lenses of cheap quality, etc. still mitigate against the good screen results which modern prints are capable of giving and which the moviegoing public demands. Yes, we've been through the mill, too!

Modern Aids to Good Focus

The image resolution on release prints is generally better than it was in small-screen days. This is especially true of color prints, inasmuch as many black-and-white prints of the early days of silent pictures were clearer than the soundfilm prints of the 1930's and 1940's. No, we don't know why!

Lenses have been greatly improved by the adoption of Gaussian lens systems for the short and medium focal lengths, and by the use of antireflection coatings to increase light transmission and to improve contrast. Gaussian lenses (3 or 4 lens elements) make possible larger, "faster" lenses with a wider flat-field subtense for the higher image magnifications required by widescreen projection.

This is not to say that all recent prints have good image resolution—they don't—or that all the newer lenses are better than some of the old ones—they aren't. On the whole, however, there has been a decided improvement.

Then, too, interference-type filters and "cold" mirrors make the old complaint of film-buckling arc amperages sound like a pretty lame excuse. Naturally, modern arclamps of the highest power buckle the film and ruin the focus if used with ordinary silvered mirrors or without heat filters! Used with cold mirrors, even the most powerful arclamps available—lamps like the Strong U-H-I and the Strong Jetarc—heat the film no more than ordinary low-power Suprex-type lamps do.

Our earnest recommendation: Use cold mirrors or interference-type heat filters if you are burning more than 75 amps. Your focus will visibly improve.

Limit Widescreen to 1.75/1

It goes without saying that *excessive* magnification to obtain ridiculously high aspect ratios on the screen makes sharp focus absolutely impossible and exaggerates such projection imperfections as buckling, flutter, scratches on the film, photographic image grain, sideweave, and intermittent unsteadiness. In addition to this, the loss of light occasioned by outsize aspect ratios is very serious. The picture on the screen is a bit dim even when the film in the projector is taking all the radiation it can accept without damage.

Not only does excessive magnification show up all the shortcomings of the projection process, but it requires the use of lenses which are not too well corrected if they have high optical speed, and which are so lacking in depth of focus that the smallest amount of film flutter at the aperture ruins the focus of the picture.

These are the reasons why it is bad judgement to

This caution can easily be removed from IP by cutting near the border line, mounting on cardboard and hanging on the wall where it will do the most good — near the projector.

use an aspect ratio of 2/1, or even 1.85/1, for non-anamorphic 35-mm projection. It is utterly foolish to match the non-anamorphic aspect ratio to the 2/1 or 2.35/1 ratio used for CinemaScope projection — foolish because it is ruinous to the brightness, clarity, and steadiness of the picture. Very good results are being obtained with a widescreen aspect ratio of 1.75/1; and all experience to date—the experience of thousands of projectionists—confirms our conviction that the 1.75/1 ratio gives the most pleasing widescreen picture.

Is the Lens at Fault?

The quality of the projection lenses is suspected perhaps a bit more often than it should be. Following are some tips that may help pinpoint lens defects when they really exist:

1. Black-and-white images are blurred by purple and yellowish green fringes which may be seen when the projected pictures are closely examined from the front rows of seats. In this case the lens is at fault. It has not been properly corrected for chromatic aberration, the purple and yellow-green fringes constituting what is called a "strong secondary spectrum." Inasmuch as this is the fault of the lens designer, there is no cure except the use of new lenses of better quality.

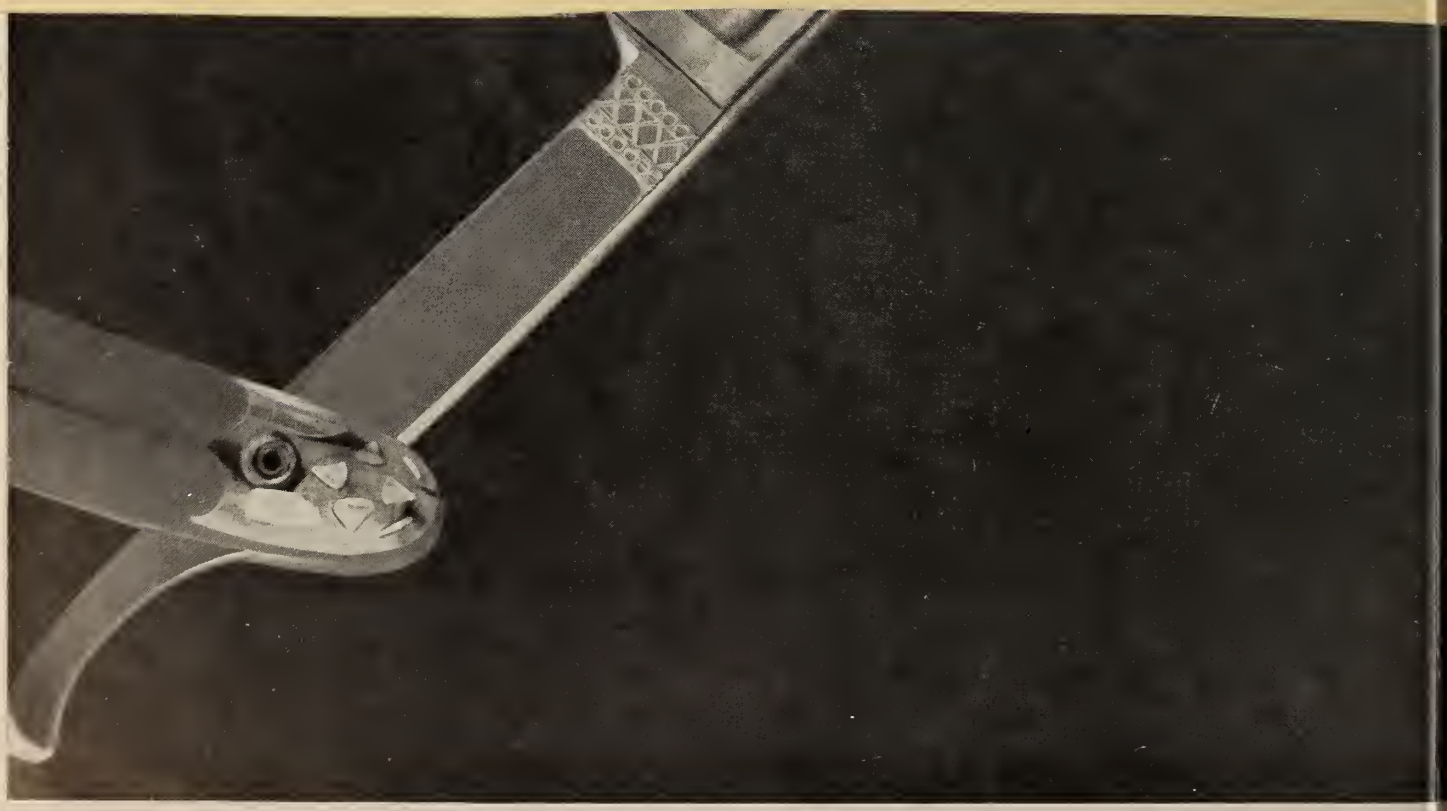
2. Either the middle or the edges of the picture can be focused sharply, but not both regions at the same time. The lens (which is ordinarily of the older Petzval 2-element type) has excessive field curvature; and if the extreme edges of the picture cannot be focused sharply under any conditions, the lens suffers from "coma" as well. Lenses having these defects should be replaced by new lenses of better quality, and preferably of the flat-field Gaussian type unless the focal length is longer than 5½ or 6 inches. Until the "cure" (new lenses) can be effected, maintain a good focus on the middle areas of the picture and forget the edges.

Uneven Focus

3. The picture can be focused clearly except for one side or one corner. Rotate the lens barrel to different positions in its holder to find out whether the *same* side or corner of the picture remains out of focus. If so, the lens is not at fault. Investigate the following two possibilities after examining the pictures on the film with a strong magnifying glass to eliminate the further possibility that the print, itself, is at fault.

(a) Closely examine the lens holder of the mechanism to make certain that the lens is properly centered and that it is securely held square to the aperture.

(b) If the lens mount is okay, check the alignment and flatness of the gate film rails or runners. (Worn runners are the usual cause of the trouble.) Hollowed spots and other small deviations from perfect flatness warp the film at the aperture and throw



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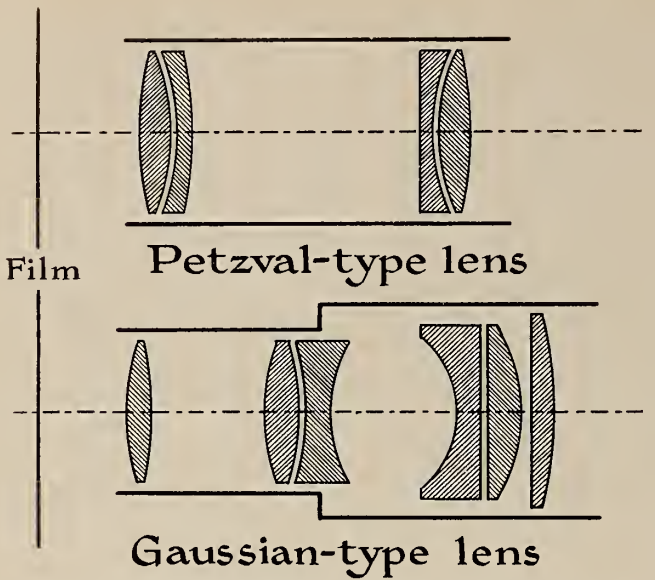


FIG. 1—The arrangement of the lens elements in Petzval and Gaussian projection lenses. Petzval lenses, if antireflection coated, are still preferred for focal lengths longer than 5½ inches. Gaussian lenses have a flatter imaging field, and are decidedly better for the shorter focal lengths and higher optical speeds.

one side or corner of the picture out of focus. This is usually the side of the film nearest the gate runners —the "non-soundtrack" side which is imaged on the righthand side of the screen.

Check the flatness of the film-runner surfaces with a steel straightedge, directing a flashlight beam on the casting behind them to make the humps and hollows show up better. The slightest departure from perfect flatness calls for immediate replacement of the runners. It's a good idea to replace the gate-door tension pads at the same time—they may have humps where the runners have hollows, and vice versa.

Projector Port Glass Important

4. Even though other factors may be causing the trouble, it is natural to blame the lens when the pictures projected even from prints of high resolution are consistently fuzzy on the screen. Try out the other lenses used for CinemaScope and other aspect ratios to see whether the fuzziness is still present. If it is, the lenses must be exonerated and other causes sought.

(a) Remove the glass from the projector port-hole while a print known to have sharp resolution is being projected. If focus on the screen suddenly improves, a change must be made in the projector ports —either the ports are wrongly angled relative to the projection beam or the glass is dirty or of poor quality.

Keep in mind that the beam of light issuing from the projector lens is an *image-forming beam.* Ordinary plate glass, such as the kind used for store windows, may alter the direction of the rays just enough to interfere with image formation on the screen, spoiling the focus. Only flat-ground and highly polished optical glass should be used in an image-forming beam. And even though we might like to recommend that both surfaces be antireflection coated, the cost of such glass seems too high except for theatres where no expense is spared to insure projection of the very highest quality.

One other important point in connection with the projector port-hole glasses should never be overlooked by the quality-conscious projectionist. The glass should be *squarely perpendicular to the axis (center line) of the light beam.* That is, if there is an appreciable projection angle (greater than about 5 degrees as measured with a protractor), the glass holder should be tilted relative to the front wall of the booth to insure this condition. The upward tilt of the glass should be exactly the same as the downward tilt of the projector—then, and only then, will the axis of the light beam pass through the glass squarely.

If the port glass is parallel to the wall when the projector tilts downward at an angle exceeding 5 degrees, internal reflections inside the glass will adversely affect focus on the screen. And the shorter the focal length of the lens, the worst the effect will be.

Blur Caused by Film Motions

(b) Rapid buckling or in-and-out fluttering of the film at the aperture caused by excessive heat makes it possible to secure a sharp focus on the screen, especially if the lenses are of such short focal length that they have little depth of focus. Interference-type ("dichroic") heat filters or "cold" mirrors effectively reduce heat at the aperture by filtering out the useless, heat-producing infrared rays emitted by the arclamp. As we suggested previously, such heat-reducing filters or mirrors should be used in all cases where arc currents exceed 75 amps.

Conduction heating of the margins of the film by hot gate rails or film runners is effectively prevented by water-cooled gates. (Air-cooling of the film is less predictable in its results.) The use of modern curved-gate mechanisms greatly reduces film buckling, and also improves the clarity and steadiness of the projected pictures.

(c) A defective intermittent movement may cause such a rapid misregistration of the film frames that the effect on the screen is very similar to that produced by a faulty lens. The particular intermittent defect likely to cause this trouble is a loose starwheel-shaft bearing. (The starwheel and sprocket are both fastened to this shaft.) This was a common complaint in the days of Simplex Regular single-bearing movements, but is rarely encountered nowadays.

(d) Needless to add, a soiled lens casts a veil of fog over the whole picture and blurs the outlines of the images. Contrast is also reduced as light spills into shadow areas of the picture, and fine detail in

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the brighter areas may be largely lost. But what is most needful to append is the fact that many projectionists who are meticulous about the cleanliness of their lenses are actually using soiled lenses without knowing it!

Oil Fog on Lens Surfaces

Just in case the foregoing remark is hotly contested, here is the explanation. Seasoned prints are often oily. When the oily film enters the heated projector gate, some of the oil is vaporized and condenses upon the relatively cool glass surface of the lens. A focus-ruining, light-scattering fog of tiny oil droplets is thus formed on the lens surface facing the aperture. Some of the oil vapor may also find its way inside the lens, if not of the hermetically sealed variety, and fog the inside surfaces. Unfortunately, this oil fog is not readily visible to the projectionist when he inspects the lens. The glass looks lustrous and clean, but it isn't.

As a rule, therefore, the lens surface which faces the aperture has to be cleaned more frequently than the other surfaces to insure efficient optical imaging. As a result, this lens surface usually gets scratched or "frosted" from overcleaning long before cleaning damage is apparent on the other surfaces. A lens thus etched by too-frequent, too-vigorous cleaning fails to deliver the crisp, contrasty images all of us want to get on the screen. Extra care should accordingly be exercised when cleaning lenses to avoid, or at least to minimize, wear and tear on the delicate glass surfaces. The following hints may be helpful:

Should Lenses be Taken Apart?

The older Petzval-type lenses consisting of only two achromatic elements (one at each end of the lens barrel) may sometimes have to be taken apart to remove oil fog and dust which have found their way inside. This should not be necessary very often, however. *Gaussian-type lenses and the newer Petzvals in which the lens elements are hermetically sealed should never be disassembled.* It is not likely that oil vapor will ever seep through the seal. The lens may be irreparably damaged by attempts to force it open; and once the seal has been broken, trouble will be experienced by the entrance of oil-laden air.

Never in any case should the convex and concave lenses of a cemented achromatic doublet be separated.

(Please turn to page 14)

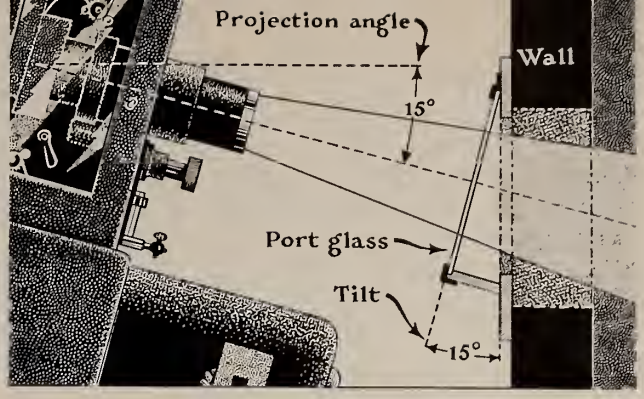


FIG. 3—In order to avoid the image-blurring effect of internal reflections, the optical axis of the projector should pass through the port glass squarely. In theatres where a substantial projection angle exists, therefore, the port glass should be tilted out from the bottom at an equal angle to minimize adverse optical effects. The projected pictures will then have maximum clarity.

Glenn E. Matthews Honored by SMPTE

New York—Glenn E. Matthews, technical editor for the Research Laboratories of the Eastman Kodak Co., was honored for his outstanding service to the Society of Motion Picture and Television Engineers, by the presentation of a scroll, at the 92nd Semiannual Convention of the SMPTE.

At a recent meeting of the board of governors, John W. Servies, then president of the SMPTE, cited Mr. Matthews for his able and devoted service to the society over a period of many years. Mr. Matthews joined the SMPTE in 1930 and in 1934, he was named a fellow of the society. From 1938 to 1940, and from 1947 to 1957, he served on the board of editors, and since 1957, he has been the editorial vice-president of the SMPTE. He was the chairman of the progress committee from 1930 to 1931 and chairman of the papers committee from 1936 to 1938. He was program chairman of the 78th SMPTE Convention.

Mr. Matthews received a Bachelor of Science degree in 1920 and a Master of Science degree in 1921, from the University of Minnesota. **iP**

EDITORIAL

from page 3

Perhaps the TESMA Trade Show at the Allied Convention will change that, with the average theatre owner more equipment-minded in the face of more competition from the new and remodeled theatres with the mobile American public going miles in their cars to visit the finer film houses equipped with the latest projection machines and sound systems.

This journal and subscribing craftmen wish all success to the TESMA Trade Show at the forthcoming Allied convention.

If it makes theatre owners more conscious of their booth equipment—projectors, sound systems, screens and their associated equipment—it will be a great boon to the motion picture industry, because the moviegoers will note the improvement as they see quality pictures with quality projection and sound.

And, incidentally, it will make more jobs for projectionists. **iP**

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Pine Hollow Theatre in Oyster Bay, N. Y. Opened by Skouras Theatre Corporation

NEW YORK—The slogan of the new Skouras circuit's Pine Hollow Theatre at Oyster Bay, L. I.. is "viewing comfort," and the new film house has the equipment to make that come true — with comfortable seats, a screen nearly as wide as the auditorium. Norelco 70/35mm with Ashcraft lamps, Techinicote screen. Altec 6-channel sound system, curtain controlled from the booth, air conditioning, and a handsomely decorated lobby and auditorium.

The Pine Hollow Theatre was opened Oct. 17. It is located in a shopping center, at Pine Hollow Road.

According to Skouras Theatres Corp., the cost of the new theatre was $250,000, with an added cost of $100,000 for the equipment, including the air conditioning system. Drew Eberson was the architect and decorator of this 600 seat modern motion picture house.

The Pine Hollow has seats on the auditorium floor with no balcony. The auditorium features full center down lighting, with walls and drapes of beige and white. The seats are upholstered in red with beige frames, with red, gold and black carpeting.

The foyer has a floor of fieldstone with down lights with walls treated with gold stripe vinyl with full walnut trim. The lobby with the inevitable candy counter, picks up the gold stripe vinyl with more walnut trim. Original local scene paintings on the walls with full drapes over the picture windows and carpet that matches the auditorium floor covering with glass doors separating it from the foyer.

The front of the theatre has two entrances, and is constructed of cement block with stucco over it, fieldstone, steel and glass. The name is in script with a two-line marquee which extends from two sides of the canopy.

The projection booth is ceiling high in the back of the auditorium, and it is equipped with all the accessories such as film cabinets, changeovers, rectifiers, etc. Joe Hornstein supplied the equipment.

Two Norelco 70/35mm projectors have 6-channel sound system, which means the Pine Hollow Theatre can run prints in all processes.

The first attraction at the Pine Hollow Theatre was "Requiem for a Heavyweight" day-and-date with Broadway theatres.

The scale of the theatre is 90c for matinee weekdays, Saturday matinee $1, $1.25 for weekday evenings, $1.50 for weekends, with children 50c at all times.

Work started on the Pine Hollow Theatre in the middle of June. 1962.



The outer lobby of the Pine Hollow Theotre is done in noturol slote, leoding through the glass-ond-oluminum woll to the inner lobby ond refreshment stond. The ticket booth is not enclosed.



There is no bolcony in the 600-seot house, ollowing plenty of room for o projection room os corefully designed os any other port of the theatre. Norelco projectors are used with Ashcraft lomps.

Lawrence W. Davee Of Century Projector Gets Warner Award

New York—The Samuel L. Warner Memorial Award, presented annually by the Society of Motion Picture and Television Engineers, has been awarded to Lawrence W. Davee. The Warner Medal recognizes outstanding contributions in the design and development of new and improved methods and/or apparatus for sound-on-film motion pictures, including any step in the process.

Mr. Davee conceived the idea for a transistorized theatre sound system with transistorized switching and supported its engineering development. These systems have now been installed in many theatres all over the world and are contributing to the quality of reproduced sound and picture. Mr. Davee has also promoted the design and installation of improved 70mm projection equipment which is contributing to improved picture quality.

Now president and engineer of the Century Projector Corp., Mr. Davee has also been sales manager. At Century, research in multiple channel carrier telephone systems, original research and development of Western Electric photograph sound on film recording and reproducing systems, and design and development of high speed metal platin systems for phonograph record masters, mothers and stampers, has been carried on. Mr. Davee's firm developed and originally designed techniques for pressing phonograph records of non-filled long playing records, as well as the "Century" motion picture projectors and sound systems.

After graduation from the University of Maine, with a Bachelor of Science degree in Electrical Engineering, Mr. Davee became a research engineer for the Western Electric Engineering Department, and later for Bell Telephone Laboratories. He then became a recording engineer for the Fox-Hurst Corp. and after this, a recording engineer and studio manager for Fox Movietone News. Next, Mr. Davee joined Electrical Research Products, Inc., where, as studio manager of the Edison Studios, he was concerned with the development of wax flowing of phonograph masters, and plating techniques.

Mr. Davee is an active participant in organizations and civic activities. He is president of the Theatre Equipment Supply & Manufacturers Assn. and vice president of the United Industrial Syndicate, Inc.

The effect of lodies' toste on theotre design is shown in their lounge, where Hollywood luxury is poromount, with huge mirrors, good lighting, ond pointings on the wolls.



Following modern proctice, the curtoin, screen oreo ond orchestro ore used to set the theme of the decor and lend spociousness to the theotre.



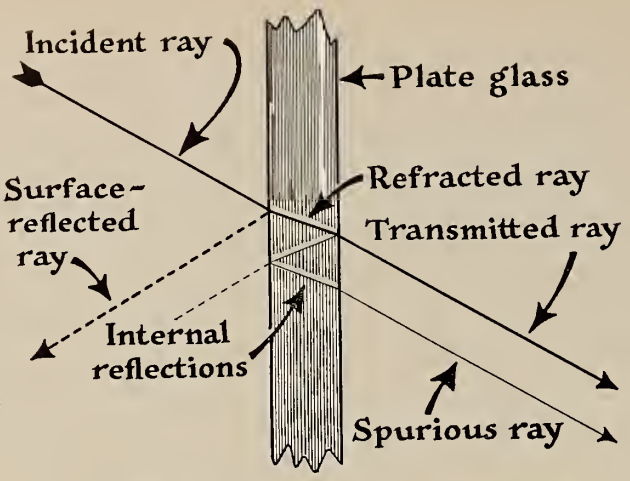


FIG. 2—Rays of light passing through plate glass at an angle are refracted (bent) and internally reflected. The reflections from inside surfaces produce unavoidable blurring of the picture when the image-forming rays from a projector pass through the port-hole glass obliquely.

If the cementing resin or Canada balsam ever becomes frilled or blistered, only the manufacturer has the proper facilities for restoring the lens.

Normally, therefore, we need attend only to the cleanliness of two lens surfaces, the back one which faces the aperture, and the front one which faces the screen. As stated above, the back lens surface needs more frequent cleaning because oil vapor from hot film condenses upon it to form a fog which gives a misty, soft-focus effect on the screen. A small amount of dust on the front lens surface is not injurious to the screen image, but fingerprints, being oily and light-scattering, must be removed.

Clean Lenses Intelligently!

Clean your lenses as seldom as possible in order to avoid wearing down the glass or the delicate anti-reflection coating which is about 1000 times thinner than this sheet of paper. Remove oil spots, fingerprints, and dirt deposits as soon as such are detected, of course; but clean the lenses only when they need cleaning, not routinely at regular time intervals whether they need cleaning or not.

LENS-CLEANING PROCEDURE

1. *Dust.* Gently brush off dust with a clean, soft camel's-hair brush.

2. *Small soil spots.* Breathe on the glass surface and wipe off *very gently* with lens tissue or a freshly laundered cotton or linen cloth, using a circular motion.

3. *Large soil spots.* Use a mild soap solution or a good brand of lens-cleaning fluid. (To make the soap solution, dissolve a piece of Ivory soap the size of a small pea in a pint of distilled or "soft" water.) Dampen a clean cotton or linen cloth with the soap solution or lens fluid, then wipe dry very gently with the cloth or lens tissue as described in (2), above.

4. *Oil on the surface.* Remove the excess oil with a swab of medical cotton-batting lightly moistened with cigarette lighter fluid or lens-cleaning fluid. Do this very carefully, then continue as directed under (3) and (2), above.

5. *Special stains.* Paint should cautiously be removed with turpentine if lighter fluid does not work. Then continue as under (3) and (2), above. To remove spots of film cement or movietone blooping ink, use acetone *with great caution.* Use very little of this powerful solvent, and avoid wetting the edge of the glass lens. It may soften the seal or seep between cemented elements, blistering the Canada balsam.

A FEW "DON'TS"

DON'T use silk or wool for cleaning lenses—they are greasy and scratchy.

DON'T use denatured alcohol—it usually contains oily, waxy impurities which make the lens even harder to clean.

DON'T use acetone except very sparingly for removing film cement stains only—it is too powerful and volatile a solvent. (Don't store acetone in a medicine bottle having a waxed cardboard lining in the cap. Some of the wax will dissolve and contaminate the acetone.)

DON'T use laundry detergents, washing powders, or dishwashing liquids on a lens instead of pure soap—they may contain chemicals which attack glass. Certain "mild" household cleansers contain borax, gritty pumice, and caustic lye.

DON'T "polish" a lens with a dry cloth. Always breathe on the glass first to form a film of moisture, then wipe very gently with lens tissue or cotton or linen, using a circular motion. This admonition cannot be repeated too often. **iP**

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INTERNATIONAL PROJECTIONIST

Published monthly at Main Postoffice, Minneapolis, Minnesota for November, 1962.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Frank W. Cooley, Jr., Minneapolis, Minn.

Editor Frank W. Cooley, Jr., Minneapolis, Minn.

Managing editor, Ray Gallo, New York, N. Y.

Business manager, None.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) 5,900.

F. W. COOLEY, JR.

Sworn to and subscribed before me this 8th day of October, 1962.

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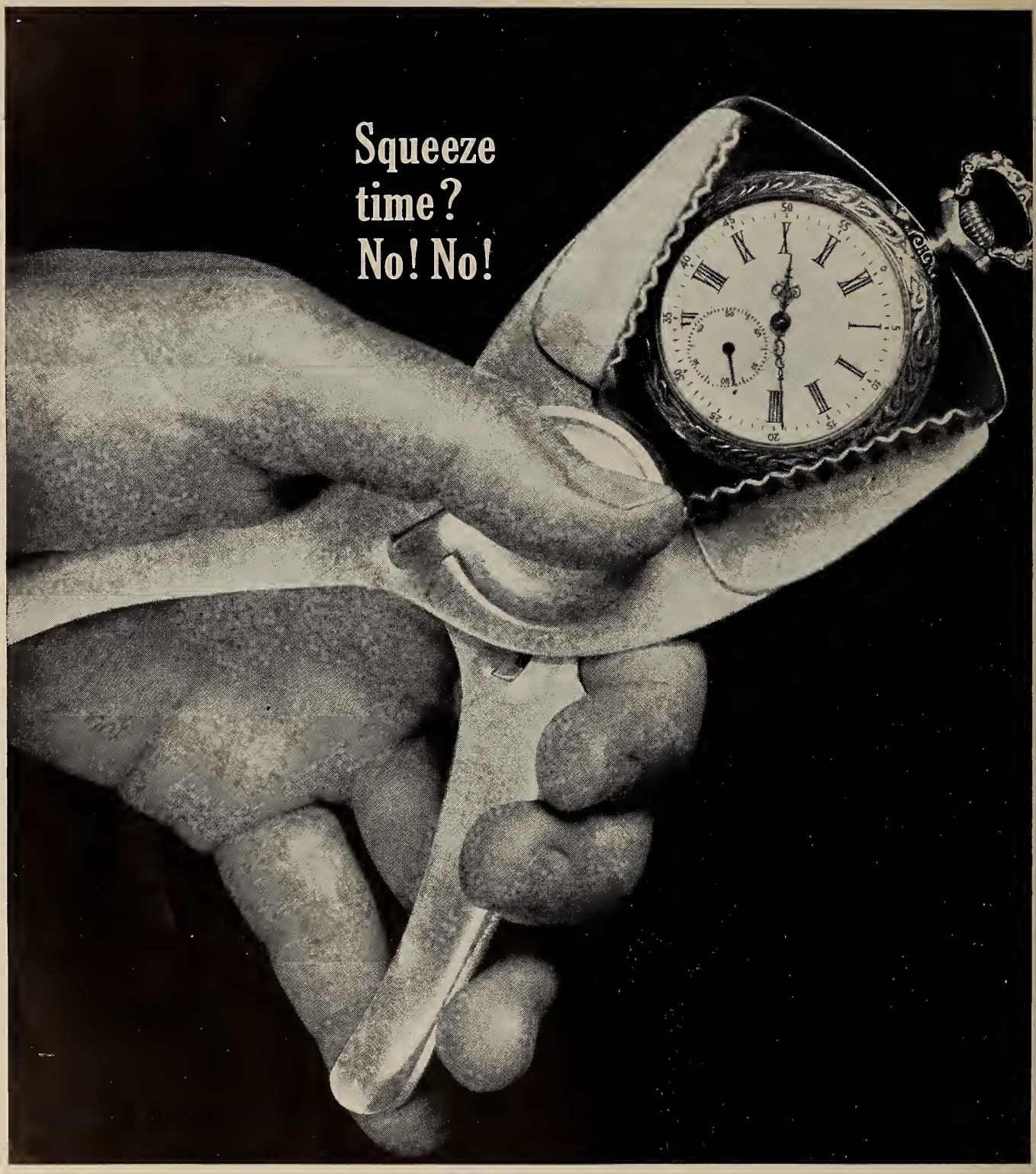


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Volume 37 December, 1962 No. 12

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INTERNATIONAL PROJECTIONIST, published monthly by the International Projectianist Publishing Ca. division of The Northern Publishing Co., Past Office Bax 6174, Minneapolis 24, Minnesota. Editorial offices, 1645 Hennepin Avenue, Minneapolis 3, Minn. Subscription Representatives: AUSTRALIA — McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND — Wixon's, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE — Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscriptian Rates: United States, Canada, and U. S. Passessions, $3.00 per year (12 issues) and $5.00 for two years (24 issues). Foreign cauntries: $4.00 per year and $7.00 for two years. Changes of address should be submitted four weeks in advance af publication date ta insure receipt af current issue. Second-class postage paid at Minneapolis, Minn. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, ar for unsolicited articles. Entire contents capyrighted 1962 by INTERNATIONAL PROJECTIONIST PUBLISHING CO.

MONTHLY CHAT

The Many Faces of Pay TV

LIKE THE DEVIL, himself, toll-TV assumes many guises. When the ill-fated Bartlesville, Oklahoma "Tele-Movie" fiasco faded from view, the ogre reappeared in Toronto as the Paramount-sponsored "Telemeter" coin-box method of making the stay-at-homes cough up a dollar per peek at a movie (not first-run!) shown on their own TV sets. Even though most home TV sets are allowed to get out of adjustment, making the pictures look worse than Edison's peep-show flickers, plans are afoot to hike the fee for home tube-viewing. Now there's Hartford, Conn.

Is this bad? For "free" television, yes; for theatre movies, no. The tiresome inanities and irritating commercials of free-TV cannot long compete *in the home* with anything, even Mary Pickford shown *sans* "important messages" of frequent occurence. But what is a modern feature movie without good color, the panoramic CinemaScope screen, realistic sound, and the relaxing atmosphere of the theatre? Movies on the home picture-tube are tiny gray things that are truly pitiful in their dramatic impotence.

There are many different systems of toll-TV, and their proponents promise fee-paying viewers first-run movies, sports events, variety entertainment, and educational courses (the last three already available for free on commercial television). But hell is paved with good intentions! It is unlikely that pay-TV, having succeeded in pushing free-TV off the air for good, will persist in a diet of first-rate fare. The movies will get older, the broadcasting more sloppy, and the cheapness of 16mm gradually substituted for the quality of 35mm. In a very short time the public will be paying for TV programs it now gets for nothing.

The Paramount Telemeter system employs coin boxes attached to the user's TV set and the regular telephone wires, not the airwaves, for transmission. In this respect it resembles the Bartlesville Tele-Movie subscription system. Paramount met with the same enthusiastic reception that greeted the Bartlesville bungle three years ago; the subscribers number thousands; and their eagerness to drop dollars into the coin boxes to escape the unimaginative, hackneyed, mind-dulling crap issued in endless torrents by free-TV is very understandable. But human nature being what it is, and the limitations of TV transmission being what they are, toll-TV appears doomed by the equally understandable urge to escape from too-familiar surroundings and enjoy a well-presented movie on a giant screen in the glorious atmosphere of the theatre.

Radio-TV critic Harriet van Horne stated the case admirably a few years ago:

"When I see a movie, I like to see it in a movie house, dark, hushed, and insulated from reality. You can't get involved with the characters and their conflicts on television. The size of the home screen, . . . the ringing of the telephone, . . . the impulse to tidy the living

(*Continued on Page* 10)

INTERNATIONAL PROJECTIONIST

Volume 37 December, 1962 Number 12

Equipment Cleanliness For A-1 Projection

By ROBERT A. MITCHELL

SERVICE ENGINEERS, visiting theatre after theatre in the course of their rounds, unanimously agree that the really good projectionists never fail to maintain their projectors in a state of scrupulous cleanliness. Dirty, grime-encrusted mechanisms, soundheads, and lamphouses bespeak neglect. And if the equipment has been neglected in one respect, it is likely to be suffering from other forms of neglect—improper or inadequate lubrication, maladjusted parts, and the presence of worn-out components which should have been replaced.

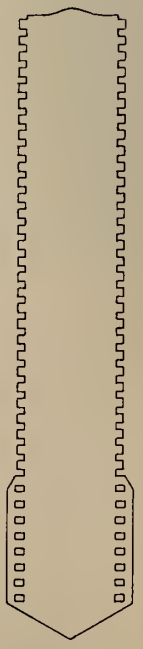
Conscientious projectionists know full well that the projection equipment must be kept free from dust, dirt, grime, and excess oil in order to function well and dependably. The effects of good equipment maintenance shows on the screen—the picture is clearer, brighter, and steadier, and the sound is crisper. The danger of loss of light, sound outages, mechanical breakdowns, and print damage is also reduced by keeping the equipment clean and correctly adjusted and lubricated at all times.

Repairs Require Special Training

We have sometimes found, when overhauling projector mechanisms, wads of dirt jammed in certain of the hard-to-reach vital parts. The projectionists who had used these mechanisms were certainly conscientious craftsmen who took great interest and pleasure in their work, but they lacked the experience to dismantle and clean these parts, themselves. Newcomers to the craft should request their service engineers to correct defects and to make adjustments which they, themselves, do not dare tackle. By closely observing how the job is done, and asking questions when necessary, they will soon acquire the know-how and confidence to undertake certain repair jobs on their own.

This writer feels that a certain amount of timidity on the part of good, but inexperienced, projectionists is much better than a tendency to tear the equipment apart recklessly and without being absolutely sure how the machinery is constructed or how the manufacturer wishes repairs and adjustments to be made. The theatre's business depends upon the functioning of the projection and sound equipment: no irresponsible tyro has a right to jeopardize the show by ill-advised attempts to tinker with delicate and complex apparatus he does not completely understand.

Repairs and adjustments, therefore, should be made



A foot-long strip of film trimmed lengthwise to leave sawtooth edges formed by the perforations is handy for cleaning the fire valves. Draw the strip back and forth between the fire rollers, and the rough edges of the film will bring out the dirt.



Cleanliness of all sprockets, idlers, and "film strippers" is important. Special attention should be accorded the intermittent and sound sprockets. Sprocket teeth are best cleaned with the aid of a stiff-bristled toothbrush lightly moistened with kerosene.

only by persons experienced in projector overhaul. The new projectionist can learn by observing the repairman's operations, by receiving instruction from more experienced projectionists, and by a diligent study of the maintenance and service manuals furnished by the manufacturers of his picture mechanisms, soundheads, and arclamps.

Cleaning Vital to Maintenance

Even a beginner in projection—the man who is "on his own" for the first time after serving his apprenticeship—should routinely clean all of the readily accessible parts of his equipment just as he routinely lubricates its various components according to the manufacturers' instruction manuals.

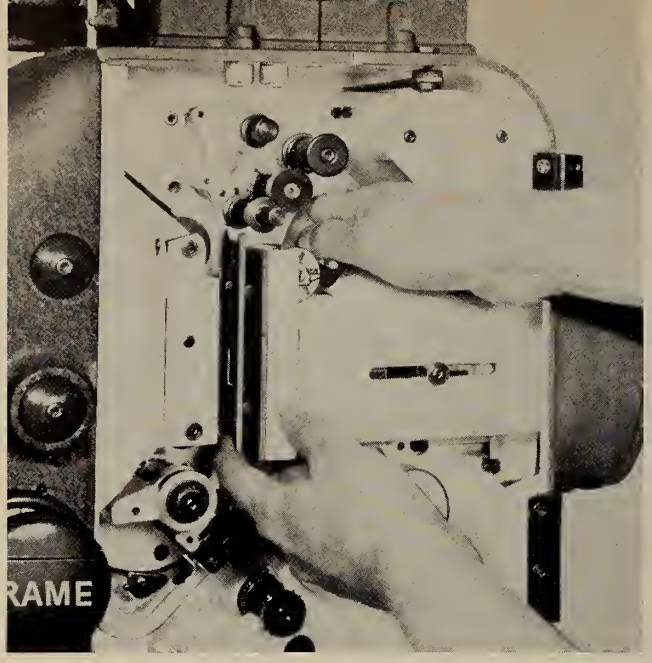
No dirt in a projector is more embarrassing to the projectionist than a wad of film dust or a fluttering strand of lint in the film aperture. It shows up highly magnified on the screen. But dirt in the aperture, though shamelessly conspicuous to the whole audience, is far less dangerous than an accummulation of film chips and greasy grime which jams the fire-valve rollers or collects behind a sprocket "film stripper."

Deposits of film wax and hardened emulsion on the gate film rails may throw the picture out of focus. Similar deposits on the face of the intermittent sprocket will make the picture jiggle on the screen. Dirt may jam the guide rollers, resulting in scored flanges, sideweave of the picture, and torn film splices. A jammed fire-drop shutter is a positive hazard to film and equipment. Grime-encrusted gears may strain the bearings and place an extra burden on the motor. Enough said?

Excess Oil Detrimental

The dirt-catching interior recesses and corners of the picture and sound-mechanism housings should be inspected at the very outset and cleaned, if necessary. This goes for the magnetic soundhead, too! The pool of oil which collects in the front of certain oldstyle mechanisms should be soaked up in cotton waste, and its recurrence minimized by refraining from "overoiling" the gear side of the mechanism and from overfilling the intermittent oilwell. The excess oil simply drains off and runs down to the floor of the mechanism, and may even leak into the optical soundhead, where it usually causes trouble.

Aside from soiling the prints and fogging the lens, excess oil is detrimental to the sound reproduction. Remember that most motion-picture sound is reproduced by an *optical* process. Oil on the sound lenses blurs the scanning beam and widens it. This attenuates the higher frequencies and makes the sound "muffled" and indistinct. Oldstyle soundhead optical tubes are not hermetically sealed: they breathe out air when warm and breathe air in when cooling off. If oil vapor is present in the air, enough oil will seep into the tube by re-



Most modern mechanisms have white-enamelled interiors to facilitate threading, oiling, and cleaning. It is more difficult to spot deposits of dirt and grime in oldstyle black mechanisms, but these can be enamelled white if there is an opportunity to dismantle them completely and leave them out of service for the greater part of a week. All oil should be removed by liberal applications of gasoline and turpentine before painting.

peated "breathings" to fog the inner surfaces of the lenses. An optical tube can be taken apart for cleaning only by a service engineer or other qualified person.

Even the cleanest film is soiled to some extent; and it deposits its dirt at various points in the film path of the projector. We have found sawdust in brand-new prints, presumably picked up en route to the theatre from sawdust-packed freight. And even as they come from the laboratory, the edge-lubricating wax and soft emulsion of "green" prints leave troublesome deposits on the film runners or rails of the gate, and on the face of the intermittent sprocket. These deposits are hard to remove because heat bakes them to bony hardness, but removed they must be, and after every reel.

Unless freshly cleaned by the film exchange, old prints are more or less oily. Dirt and dust adhere to the sticky oil and are carried into the projector. Old prints are the prinicipal source of the dirt that accummulates in the film path of a motion-picture machine.

Keep Magnetic Soundheads Clean!

The valve-roller boxes of the upper film magazines seem to be favorite repositories for the larger chunks of dirt and chips of film carried down by the print. The magazines and fire-roller boxes should be cleaned periodically even if, as in the case of certain older projectors, a thorough cleaning requires removal and re-installation of the upper magazines.

Here's a handy tip for the routine cleaning of the fire-valve rollers: Take a foot-long strip of film and, with scissors, cut off the perforation margins *just into the perforations* so as to leave a rough, sawtooth edge in both margins of the film. Draw this strip of film back and forth between the rollers. The rough edges will pick up and remove any dirt present.

The magnetic reproducer for stereophonic CinemaScope sound should be examined for dirt deposits on all film-contacting parts with aid of flashlight and magnifying glass. Wax and emulsion on the faces of the large impedance rollers will introduce flutter or wows into the sound, while deposits on the face of the magnetic cluster will introduce severe distortion and attenuation of the sound in one or more channels. Keep the magnetic soundhead scrupulously clean to get the best possible results from CinemaScope 4-track prints.

Hardened deposits of emulsion should be removed from polished film-contacting parts (scanning drums, impedance rollers, magnetic clusters, sprocket faces, film rails, tension pads, etc.) by means of an orangewood fingernail stick (obtainable at drugstores) or with a "chisel" fashioned from a short length of stout copper wire. (Many projectionists use a penny having an edge filed flat.) At all events, *never* use a screwdriver or other steel tool for removing emulsion deposits—steel scratches steel; and burrs on film-contacting parts accelerate the buildup of dirt deposits.

Cleaning Sprockets

The upper feed sprocket is the first of a series of five film sprockets found in the usual American-type projector having a separate optical soundhead upon which the picture mechanism is mounted. Each of these sprockets must be cleaned rather frequently to remove deposits of emulsion, wax, film dirt, etc. adhering to the faces of the tooth flanges, and which have a tendency to collect at the base of the teeth. Projection quality depends a great deal upon the cleanliness of the intermittent and sound sprockets.

Keep in mind that dirt may pile up under the little film-stripper plate associated with each sprocket. If you can't get behind a film stripper easily, loosen its set-screw and swing it out to clean it. Then put it back into place (making certain that it does not actually touch the sprocket) and retighten the screw.

Now, the best way to clean a sprocket is to hold a toothbrush lightly moistened with kerosene against the teeth of the revolving sprocket. A stiff-bristled nylon toothbrush works best and is probably the most durable. Ordinarily we caution against cleaning or oiling a projector while it is in motion, but this is such a handy and effective way to clean the sprockets that we offer the tip with the proviso—*be careful!*

Dirt which has collected in the flanged guide-roller assembly, and especially in the delicate little coil spring, must assuredly be removed for good results on the screen. To do a thorough job the entire guide-roller assembly should be taken out of the machine, but be careful not to disturb the lateral adjustment (if this is known to be correct) and guard against accidentally dropping the tiny screws and pivot points into the machine where they may become irretrievably lost.

Cleaning the Film Gate

Using a long-handled artist's brush, remove the dust which may have accumulated behind the aperture where the fire shutter, or dowser, drops down. If the "spot sight box" containing the ruby glass is removable, take it out to facilitate cleaning behind the film-trap assembly.

The gate runners or rails must be kept surgically clean at all times. Hardened emulsion deposits which form when the soft emlusion of new prints melts in the hot gate are especially troublesome. They cause "sticking," unsteady pictures, print damage, and blurred pictures if a deposit near the aperture forces the film out of the focal plane of the lenses. As mentioned previously, use an orangewood stick or copper for scraping off stubborn deposits, never steel or iron. Some projectionists believe that hydrogen peroxide applied



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with a small wad of cloth loosens emulsion deposits. Alternate applications of household ammonia and hydrogen peroxide will render the peroxide more active. It releases bubbles of oxygen gas.

The aperture plate, itself, should be wiped clean at frequent intervals. The little finger moistened, will suffice to remove lint and film dirt from the corners and edges. If a piece of dirt suddenly appears on the screen while the show is in progress, it is sometimes possible to get rid of it by blowing it out.

Keep the gate-door tension pads as clean as the film rails. Dust usually lodges behind the pads: remove them, if necessary, to get all the dirt out.

Special attention should be given to the cleanliness of the all-important intermittent sprocket. Use a stiff-bristled toothbrush lightly moistened with kerosene to clean the sproket teeth and flange faces. Make sure that no dirt or chips of film have lodged behind the film stripper. The intermittent-sprocket shoe (attached to the gate door as an "apron" in Simplex projectors) should be brushed clean before every show.

Soundheads Also Require Attention

The holdback sprocket and its stripper should likewise be cleaned. Following this, the next item in the film path is the optical-sound scanning point in the soundhead. It goes without saying that the cleanliness of the soundhead is absolutely essential to quality sound reproduction. Excess oil is especially deleterious to the functioning of an optical sound reproducer.

Old-style soundheads have a stationary "sound gate" with a flanged guide roller and a "sound sprocket" immediately under the gate. This is the type of soundhead that was manufactured when talking pictures were introduced; and it is still used in theatres having old-fashioned Western Electric universal projector bases. Modern soundheads dispense with the sound gate by using a cylindrical "sound drum" fastened to a rotary stabilizer shaft.

All sound-gate parts, including the lateral guide and tension pads, should be cleaned exactly as thoroughly as the gate of the picture mechanism. Accummulations of hardened emulsion and film wax on the sound-gate rails will throw the soundtrack out of focus at the crucial scanning point, "muffling" the sound by attenuating the higher frequencies. Dirt in the scanning beam, itself, will attenuate all frequencies and cause severe distortion when variable-area tracks are played. A tiny fragment of lint fluttering in the scanning beam will generate rumbling noises in the sound.

The condition of the sound sprocket, like that of the intermittent sprocket, is vital to the quality of the sight-and-sound presentations. In the case of old-style "sound gate" reproducers, a tiny piece of dirt adhering to the face of the sound sprocket will cause a "gargle" in the sound. The higher frequencies (soprano voices, violins. flutes, whistles. etc.) are most affected. Use the kerosene-moistened toothbrush for cleaning this and all other sprockets. Remove dirt from the film stripper.

The scanning (sound-takeoff) drum and edge-guiding pressure roller of the more modern soundheads require the same degree of cleanliness for flutter-free, undistorted sound reproduction. The optical lenses, photocell relay lens, and glass envelope of the photoelectric cell, itself, should be cleaned with lens tissue. As most projectionists know, modern soundheads are much easier to keep clean than the old-timers having sound gates.

Continuing down to the lower magazine, the take-up sprocket and lower fire-valve rollers should receive the same attention accorded to the other sprockets and the upper fire-valve rollers. **iP**

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Projectionist Profile . . .

Harry Garfman Serves Charity As Well As IA Local 306

More than a baker's dozen of plaques and scrolls decorate Harry Garfman's office at 250 Ashland Place, Brooklyn, which testify to his spare-time work to making the world of cripples and convalescents a little happier.

For more than 15 years, Harry has been Local 306's business agent for Brooklyn and Queens, but his philantropic and humanitarian efforts has gone on since 1939, when he was elected to the Local's Sick Committee. During his four years serving on the Committee, Harry visited many hospitalized union members, and the loneliness and tedium of hospitalization made a lasting impression on Garfman.

His activity in Brooklyn hospitals dates back to 15 years ago. "A projectionist friend of mine," Harry recalled, "had a very sick little boy who was being treated at Saint Giles Hospital in Brooklyn. I visited the boy and saw his loneliness in the hospital since the busy staff had no way to entertain the children. That was before television. So I arranged for a 16mm movie show which the kids could watch from their beds."

The films were a tremendous success. The Kings County Hospital soon heard of Garfman's good work at St. Giles, and requested that he extend his program to their institution. Harry enlisted the aid of his friends, all of them members of Local 306. These men organized the Movie Social Club of Kings County. They present free programs of film to entertain the children's wards, and every year, at Christmas time the Club gives parties for the children, for which they solicit toys and gifts from local merchants.

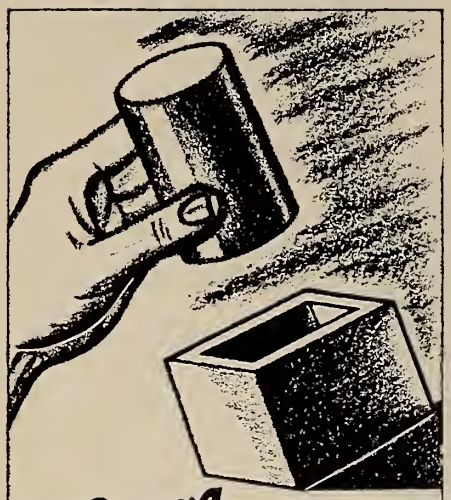
Harry was instrumental in helping to organize the Brooklyn Chapter of the National Cystic Fibrosis Research Foundation, and served as the first president for three years. Again, his activity was sparked by the plight of a friend's child. A member of the Local had a young daughter who was dying of cystic fibrosis, which was a disease little known to the public five years ago. (Among the scrolls that decorate Harry's office walls is a proclamation from Mayor Wagner in tribute to his activity in the National Cystic Fibrosis Research Foundation.)

Harry Garfman began his career in the theatre at the age of nine, when he worked as a candy vendor at the old Gotham Theatre in Brooklyn. Before long, the silent pictures began to replace stage shows, and Harry became a reel boy. At 17 he became the assistant manager of the Capital Theatre in Brooklyn, and two years later he was manager of the Ambassador at Saratoga and Livonia Avenues. That same year he married and began the family which now numbers three children and five grand-children.



Harry Garfman

Sound film was introduced when Garfman was 21, and he promptly



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MONTHLY CHAT

(*Continued from Page* 3)

room during the dull spots, and the fact that you are watching in your own busy, familiar home make it impossible to become absorbed in a movie. Rarely does a TV film take you out of yourself and into its own world.

"Rarely, after watching a movie on television, does the viewer long to discuss it with others. It's out of sight and out of mind, just like that. So complete is one's absorption in a theatre, however, that it's sometimes a jolt to find out that the picture is over."

Unlike a Chicago theatre magnate who predicted in 1957 that "all major Hollywood studios engaged in the production of motion pictures for theatres will close within the next six months," IP expects the motion-picture theatre to be with us a long, long time, ever growing and expanding and maturing as it continues to fulfill its unique and necessary function in the life of the people.—R.A.M.

became a projectionist and joined the union. He was elected to the Sick Committee of Local 306 in 1939. In 1944 he was elected to the Executive Board of the Local and served for three years.

Harry is an affable articulate man, and his experience and dedication to his Local made him a natural for business agent of 306. He was elected in 1947 for business agent for Brooklyn and Queens. As on of three paid officers—the others are Ernest Lang, secretary, and Steve D'Inzillo, business agent for New York—serves on the Negotiation Committee with the president, vice president, treasurer and financial secretary.

Over 100 theatres were closed during Garfman's tenure office as business agent for Brooklyn and Queens. This leaves 166 theatres in his territory—61 in Queens and 105 in Brooklyn.

But Harry Garfman is optimistic and happy in his career. "There will always be motion pictures," he says. "Television does not have to be a menace to our industry. There may not be so many theatres in the future as there once were, but the theatres will be improved, real showplaces. So I think we'll be seeing better pictures in nicer—if fewer—theatres." And in Garfman's future, there will always be spare time—if he works 20 hours a day—to lend a helping hand to others less fortunate than he.

iP



Harry Bernstein, Local No. 230 IATSE, is shown operating the carbon arc follow spotlight at the Paramount Theatre, Denver, Colo. Harry has spent 45 of his years in a booth and has two sons who also were projectionists. The Paramount is under the same ownership as the recently opened North Star Drive-In, Denver.

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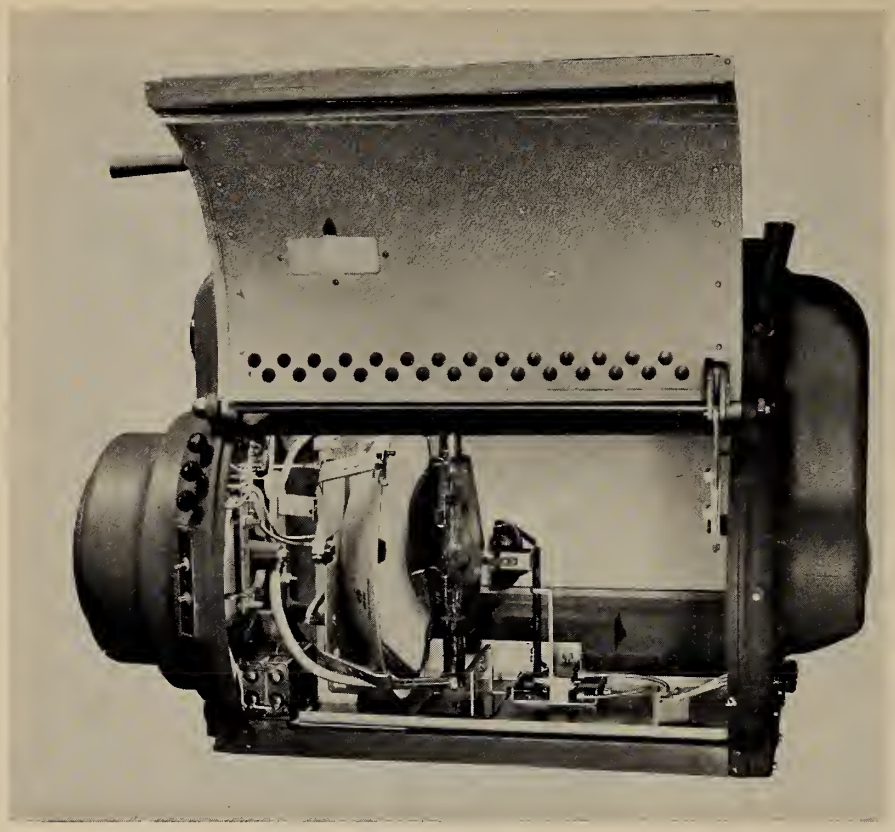
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Strong Electric has New Xenon Lamp in 900-2,500 Watt Capacities

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The lamp projects a steady, flickerless, pure white light, which is independent of voltage variations of the power line supply, and excellent for color film reproduction. Extremely even distribution of light is afforded throughout the total screen area, and "push button repeatability" of intensity and color temperature is possible.

Practically no heat is projected to the film or aperture plate. No cooling is required. Focus remains constant

The 900-watt model is designed for matte screens up to 23 ft. wide, and high gain screens up to 28 ft. wide with CinemaScope aperture.

The 1600-watt model is for matte screens up to 29 ft. wide, and high gain screens up to 36 ft. wide.

The 2500-watt model is for matte screens up to 35 ft. wide, and high gain screens up to 43 ft.

Maintenance and current costs are approximately the same as for carbon and current costs for operating a carbon arc lamp of equivalent light output. Operation is simple. There are no moving parts in the light source. Cleanliness assures maximum life for the projector.

A brochure will be sent to anyone addressing a request to the Strong Electric Corp., 10 City Park Avenue, Toledo 1, Ohio. **iP**

New Light Sensors Demonstrated

New Silicon Light Sensors, developed by the Army and Air Forces Motion Picture Service, as a longer-lasting and thus cheaper replacement for photocells in 35mm optical sound reproducers, were displayed for the first time at TOA's 15th annual convention at the Americana Hotel, Bal Harbour, Fla., this month.

Robert Quick, chief of the AAFMPS. brought with him to the Convention one of the new sensors, with mounting for adaptation both to the RCA optical type sound reproducer, and for the Simplex type of head.

The Engineering Depot of the AAFMPS, Goodfellow Boulevard and Elward Streets, St. Louis 20, Mo., will furnish technical data on the sensors on request and without charge, to anyone interested in the program.

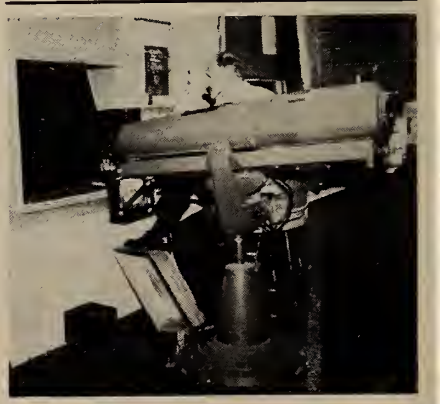
The AAFMPS has prepared the following information on the new sensors for the information of Theatre Owners of America members:

"The Army and Air Force Motion Picture Service has announced completion of field tests of silicon light sensors as replacements for photocells in 35 mm optical sound reproducers. Results have been very satisfactory and a phased program contemplating eventual complete conversion of all types of 35 mm equipment is underway.

"The type of sensor employed, provides greater sensitivity than normally-used photocell types, and requires less sound system signal amplification and no polarizing voltage supply. Additional advantages accruing from the use of sensors over photocells are greatly extended life, far greater life of exciter lamps with reduced envelope blackening and minimizing of exciter lamp socket contact troubles due to reduced lamp amperage. Although the initial cost of the sensors is higher than that for photocells, it is expected that long-term economies will result from this program.

"Prototype samples of the sensor mountings for Simplex and RCA optical sound reproducers, and photographs of these units mounted in the reproducers will be available for the inspection of TOA conventioneers at the TOA 15th Annual Convention in Florida. The Engineering Depot of the AAFMPS in St. Louis will furnish technical data on request to any exhibitor interested in a similar program.

"Our field tests of the light sensors over the past six months do not permit specific evaluation of cost savings. However, the recognized long-life factor of solid-state devices, the increased life of exciter lamps due to operation with reduced filament current, and other factors, definitely permit anticipation of long-term economies in equipment operational costs." **iP**



H. A. Howell, IATSE Local 545, operates a Strong Trouper carbon arc follow spotlight at the Cocoanut Grove Playhouse, Miami, Fla.

Coronet, Luxury Twin Theatre Above the Baronet, Opens This Month

NEW YORK—The 600-seat Coronet Theatre opens Dec. 14, a twin house above the Baronet Theatre on Third Avenue at 59th St., operated by the Walter Reade-Sterling Corp.

Designed by New York architect John J. McNamara, the pickaback theatre has many new theatre features, notably at the street level the so-called "air curtain," the first to be used in theatre construction, which eliminates the customary front doors and which reveals an unobstructed view of the vestibule and lobby.

It provides controlled temperature by 10 built-in heating panels in the canopy soffit, cooled in summer and warmed in winter, intended to keep waiting patrons warm in cold weather.

The facade of the twin theatres rises to a height of 70 ft. The front is decorated in bold black with white vertical stripes, across which in gold script is the "Baronet-Coronet" insignia.

In the Coronet vestibule the floor is of Italian glass mosaic in midnight blue and gold, with the ceiling of gold perforated metal acoustical panels with luminous light panels. In this area is the circular ticket desk. A short flight of travertine marble steps leads to the Coronet lobby. An escalator leads to the Coronet's upper lobby and the orchestra floor.

The Coronet, as in the Baronet. the auditorium is covered with carpet not only in the aisles but under the seats which makes for patrons' comfort and acoustical improvement.

The seats in both the Coronet and Baronet are upholstered in white vinyl.

The booth of the Coronet is equipped with Century projectors, with Ashcraft Cinex Special arc lamps; Century transistor sound system and Ashcraft rectifiers.

Each theatre's vestibule will have a camera interconnected with the two managers' offices and by visual reception through this system will enable the managers to insure an orderly and continuous flow of traffic.

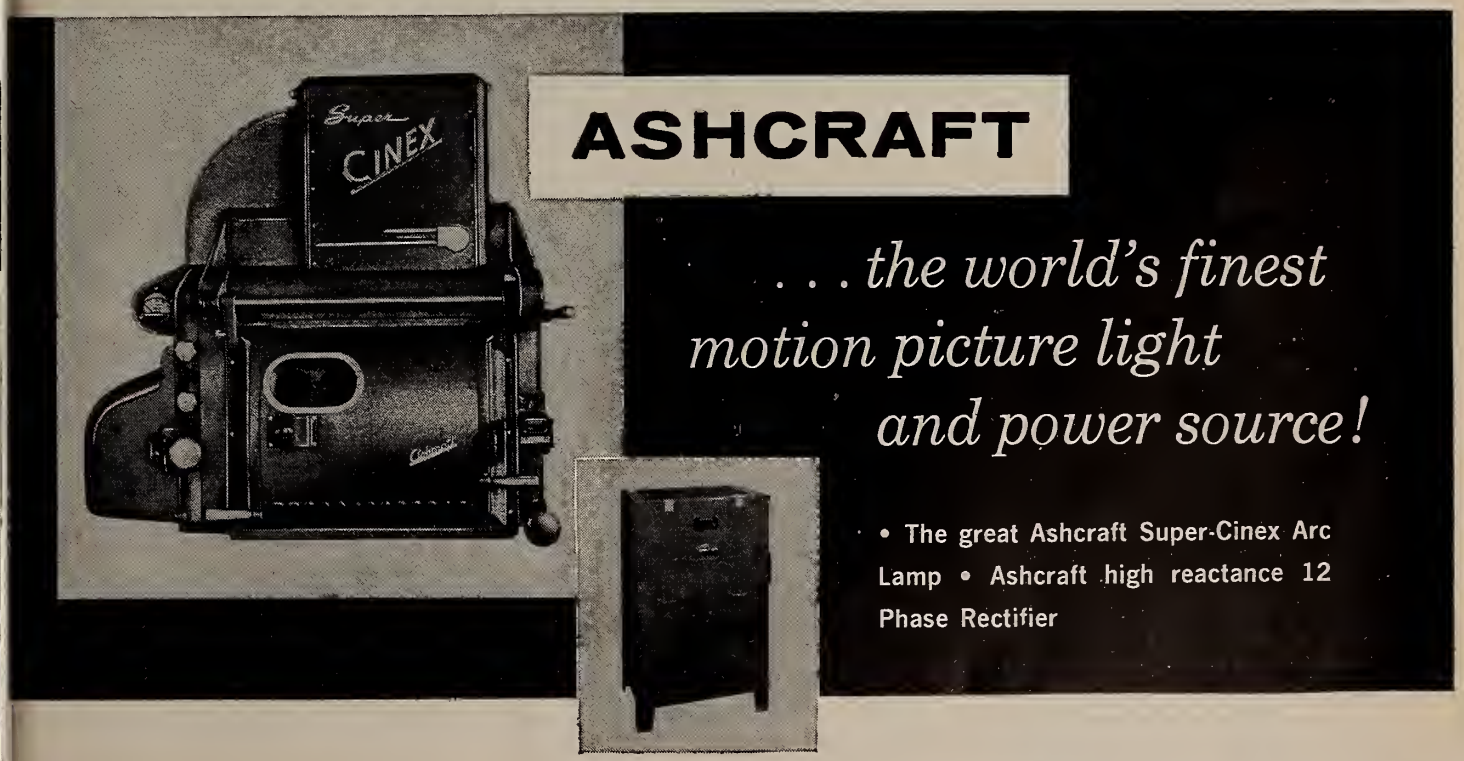
Installed in the Baronet and Coronet is a closed-circuit television system, and both theatres will profit by the system. **iP**

Edward P. Curtis Retires As Kodak Vice President

ROCHESTER, N. Y.—Edward P. Curtis, Eastman Kodak vice president and well known aviation authority, has retired from the company. He will continue as a member of the Kodak board of directors.

A major general in the United States Air Force Reserve. Curtis served with distinction in both world wars. He is a winner of the Croix de Guerre, the Order of the Bath, and the Distinguished Service Cross.

He joined Kodak in 1920, was elected to the board of directors in 1957, and has been a member of the company's executive committee since 1960. **iP**



ASHCRAFT Super-Cinex projection lamps and ASHCRAFT 12 phase high reactance rectifiers are the world's finest and most widely ed light and power source for professional motion picture projection. ■ This distinction has been earned because ASHCRAFT uipment is designed and built to surpass the demanding standards of the theatre owners and projectionists the world over. When you consider ASHCRAFT arc lamps and rectifiers for your theatre, you can assured there is no finer, more dependable source of light and power ilable... anywhere.

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Modern-Day Projectionist Benefits by Equipment Advances; 45-Year Veteran Recalls the Old Silent, Hand-crank Days

By Kenneth C. Lowe, IATSE

Looking back over the 45 years I have spent as a motion picture projectionist, I cannot help being impressed with the changes and improvements that have been made in the work. The fellow who is responsible for putting the picture on the screen in movie houses today has a much easier time of it than we did when I started as a boy of 13 years. Modern day equipment has also contributed immeasurably to the enjoyment of the movie viewer.

My experience as a projectionist includes working every house in Grand Forks, eight years at an outdoor theatre here and five years at the Sherman Theatre in St. Cloud, Minn. Besides my job, I have run endless numbers of films for schools, churches and organizations and sold projection equipment for a number of years.

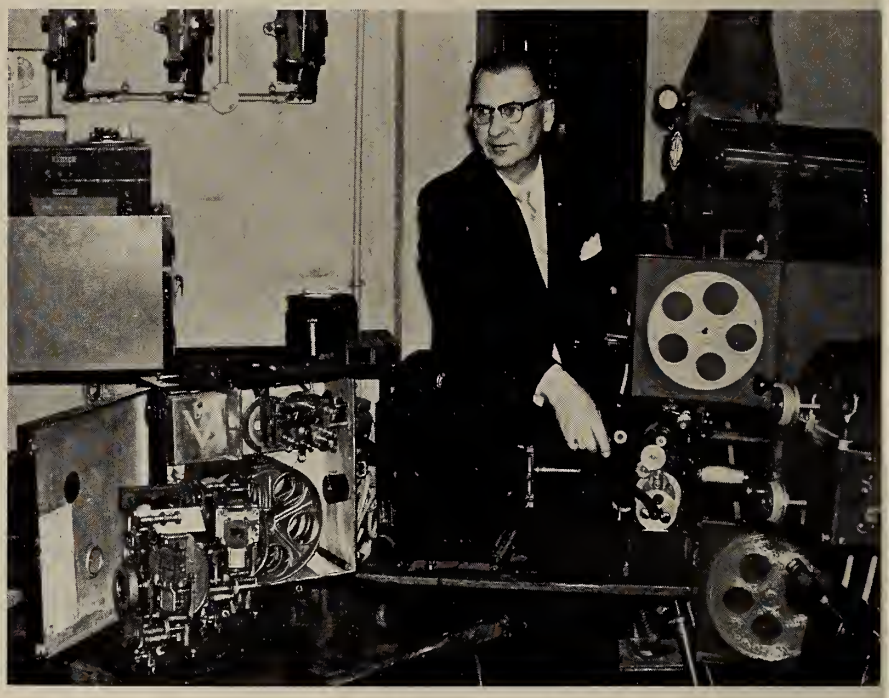
As a hobby I have collected old projectors, and some of these are shown in the accompanying illustration. The oldest machine in the group dates to 1904, and is a hand cranked Edison Kinetoscope weighing about 150 lbs. It is mounted on a wood type horse supported by four metal legs. I also have two Powers No. 5 Cameragraphs, (both hand crank models). Another old timer is a De Vry portable with feed and take-up on the same shaft and using a Mazda lamp.

When I started in the business most of the movies were four to six reelers while the "supers" ran eight reels. Carbon arcs furnished the light which made the image visible on the screen. If the carbon needed adjustment or had to be replaced, pliers did the job. The carbon was imported from Germany, and a shipment we received just before the U.S. declared war on Germany in 1917 arrived on the submarine "Duetchland." Another thing about the carbon that comes to mind is that much of it was of inferior quality and it was a dirty job grinding a bevel on each one. For this task the operator was paid one cent apiece.

In using the crank models the operator really had to be ambidextrous and quick witted, as a certain cadence had to be maintained. The picture generally moved at the rate of 16 frames a second and the reels had to be changed every 15 minutes. While the switch was being made a slide commercial was put on the screen for a minute or so. Some of the slides had catchy reminders. An example of these were "Don't spit on the floor;" "Remember the Johnstown Flood;" or "Ladies please remove hats." A washing machine ad used this slogan: "Let us do your dirty work."

Even before the automatic changeover which now makes this operation practically unnoticeable, a good operator could keep the continuity from being interrupted very long. To do this, the projectionist would let the used film fall to the floor and slip the next reel into place in a flash.

Some times they were almost too fast, as now and then, the advertisers complained that there wasn't time to read what they said about their products.



Kenneth C. Lowe, Grand Forks, N. D., projectionist for 45 years, is shown with his collection of antique movie projectors. Among the relics is a 1904 model Edison Kinetoscope which is operated with a hand crank.

Film breaks were a bug-a-boo of the old days. When this happened, which was all too often, quick repairs would be made with wire, gum, glue, paste or whatever was handy. During the break there would be loud "boos" from the impatient audience. (Moviegoers haven't changed much in that respect because we still get "boos" if there is an interruption in the picture for any reason). Films were pretty dry and brittle in the early years and sometimes they required hours of repairing and splicing. Necessity being the mother of invention, we hit on a formula for

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making a good cement for this purpose. It consisted of old film dissolved in acetic acid and collodion. The concoction made a perfect binder and it was used for all film repair work. A pan of eucalyptus oil was placed in the film cabinet to make the film more pliable.

Projectionists used to work out in the open before the days of "private" booths. Usually the projector was perched on a platform in the center of the balcony. A railing around the edge of the platform was meant as a safety feature as well as to keep out intruders. Yet, the operator never left the machine lest some prankster turn the crank or meddle with the film. A common practice among youngsters in those days was to harrass the operator by hanging a cap over the light.

Among the early companies that supplied films were Vitagraph, Biograph, Universal, Essanay, Selig, Paramount, Fox, First National, Pathe, Metro Goldywn Mayer, Bison, Thanhouser, Edison, United Artists, David Belasco Productions, Charles Ray Productions, King Vidor, Keystone, Epic, Bellamy and D. W. Griffiths.

In addition to my work as a projectionist, I have taken part in a variety of outside activities. For nine years I was a member of the Grand Forks City Council, served nine years on the State Electrical Board where I checked all theatres in the state and licensed all the operators. Presently I am completing my third term as a member of the State legislature, having been elected to the House of Representatives on the Republican ticket in 1956.

I took out membership in Local 231, I.A.T.S.E. in 1924. This group was organized in 1912. In 1949 I became a member of Local 666, I.A.T.S.E. **iP**

NEW SLIDE ADAPTER

Toledo, Ohio—A new 2"x2" adapter has been developed for use with the 3¼"x4" automatic changer on the Strong Universal Carbon Arc slide projector. According to the company the new device makes this equipment not only the most powerful but also the most versatile. In addition to automatic projection of the two sizes of slides, manual projection is also possible with any sizes.

Literature on the Universal projector may be obtained by addressing a request to the Strong Electric Corp., 10 City Park Avenue, Toledo 1, Ohio. **iP**

CORRECTION

In the Projectionist Profile on Harry Mackler in the October issue of International Projectionist, the article indicated that Mr. Mackler was the only living past president of the 25-30 Club. This is incorrect; it was intended to indicate that he was the only living past president of IA Local 306, in addition to his many other interests in civic and social organizations. Mr. Mackler retired from Local 306 in February, 1953. However, he retains his interest in projection through his other industry clubs, and has always made himself available for consultation on projection problems. **iP**

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Plain Talk to the "Light Merchants" On Improving Theatre Projection



By William Cosby
•
National Carbon Co.

It is always a real treat for me to talk shop with my fellow "light merchants." You may not have thought of it this way before, but we are really both dealing in the same commodity, screen light. When theatre patrons buy their tickets at the box office, they are paying to *see* a motion picture—they are buying a visual image — and it is your responsibility to give them the very best for their money.

In the same way, it is our responsibility at National Carbon—as it has been since the inception of the motion picture industry—to give the theatre owners and projectionists the most for their screen light dollar.

The motion picture exhibitor industry seems to be caught up in an optimistic spirit that beats any we have witnessed in a long time. There appears to be no slackening in the increased pace of new theatre construction and modernization, a trend in which many of you are participating by investing considerable sums of money in providing comfort and convenience for your patrons that has brought the movie-going public back into theatres in a heartening wave. You, and only you, have complete control over the three factors that bring patrons to the box office —entertainment, comfort, and quality. The entertainment can be carefully picked from the excellent pictures being produced, and the comfort is provided by the physical plant you operate. Both of these factors represent sizeable amounts of money. Don't jeopardize this investment. The really remarkable thing about quality screen light is that its cost is insignificant as compared to its importance. Let me give you some figures to show you what interesting situations can develop.

I've had theatre owners point out to me how much money they think they can save by buying some of the cut-price carbons that sell for "discounts" of perhaps 10%. My answer, based on cold, economic facts, is, "Yes, but 10% of what?" Here's what I mean. The small indoor theatre that operates something like five hours a night is paying about 18c an hour for quality projector carbons—a figure that many of you possibly did not realize is so small. So 10% of the nightly 90c carbon cost totals the grand sum of 9c. Think of it, gentlemen, a $1-million picture running in a first-rate theatre, and the owner talks about saving 9c a night, at the same time depriving his patrons of what they paid to see, a quality picture on the screen. An extra box of popcorn sold in the lobby would make up the difference, and the theatre owner would be giving his audience the best possible entertainment. That's why I ask, "10% of *What?*"

Another exhibitor brings up the argument that such-and-such a carbon burns slower. Sure, but it is also giving less light, and in his drive-in theatre, with its long throw and giant screen, he needs all the light he can get. All the light reaching the screen goes through an aperture about the size of a postage stamp, and that shutter action keeps the screen "dark" half the time. That's why any thing that reduces the light in the projector lamp is also reducing the enjoyment in the seats. Maybe the other carbon does burn 3 to 5% slower, but the saving is so little it just isn't worth the gamble. The thinking exhibitor knows it, and that is one of the reasons our quality projector carbon business is on the same upward swing as box office figures.

National Carbon Co. has maintained its position of leadership in the projector carbon business through a continuous program of research and development. The objec-

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tive has been to develop carbons of the highest quality so as to assure theatre owners of maximum efficiency from their carbon arcs. We say that the carbon arc is closest to the sun in spectral quality and we aim to keep it so.

Recent laboratory findings have confirmed that the carbon arc is, indeed, closest to the sun. Scientists had assumed that the sun and the carbon arc had identical outputs over the entire range of the spectrum, and this significant correlation has just been confirmed in a series of measurements made in our development laboratories.

Using a Perkin-Elmer recording spectrophotometer—one of few instruments capable of doing the job—National Carbon engineers measured the spectral energy distribution of radiation from the carbon arc all the way out to 150,000 angstroms. Data were then plotted on a curve showing the spectral energy distribution of the sun outside the earth's atmosphere from 2500 to 60,000 angstroms, which includes from 98 to 99% of the sun's energy output, and the two curves were found to follow each other very closely over the entire range.

Armed with this scientific confirmation, space equipment designers can now use banks of carbon arcs with no filters or added energy in test chambers to simulate conditions of solar radiation in outer space. The space chambers already in operation use carbon arcs, and large chambers now under consideration will undoubtedly also use this high-intensity energy source to simulate solar radiation.

Much of the sun's energy is absorbed by the atmosphere, and never reaches the earth. Once space vehicles are above an altitude of approximately 300 miles, however, the atmosphere is so rarified as to absorb none of the sun's energy, and solar radiation becomes a critical factor in the operation of the vehicle, component parts and such devices as solar cells that are used to convert the sun's energy into electrical power for the vehicle.

The superior performance and reliability of the carbon arc as a light source is being increasingly recognized in other fields. A recent example is the new battlefield searchlight developed for the army. This is a 30 in. searchlight with a peak beam candlepower of 400,000,000—50% brighter than the heavy, cumbersome 60 in. searchlight used for anti-aircraft protection before the advent of radar.

Experience in Korea proved the value of the searchlight for blinding the enemy or illuminating targets but existing searchlights lacked the mobility needed to make them effective. The new 30 in. searchlight has been developed by one of the leading projection lamp manufacturers and National Carbon has worked closely with them in the perfection of suitable carbons.

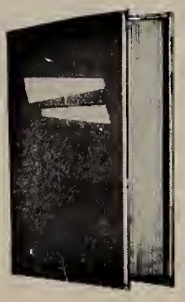
I've digressed a little from the subject of screen light to show you some of the new ways that your favorite light source is being used. Our work in these fields helps us do a better job for you so I'll close with one final point.

We at National Carbon have made it our business to produce high-quality arc carbons so that theatre owners can give their theatres the best in screen light. **iP**

PROJECTIONIST DIES

MINNEAPOLIS — John D. Winslow, 64, a motion picture projectionist, died here. He was a projectionist at the Mann Theatre and a member of International Alliance of Theatre Stage employees and Projectionists, Local 219. **iP**

How electrical noise is produced . . . calculated . . . measured . . . controlled



Here are the basic facts about electrical noise – how it originates in circuits . . . what terms describe it . . . how to measure it . . . how to design circuits to minimize its undesirable effects. The physical nature of the various sources of noise are clearly described, including such sources as thermal agitation or resistance noise . . . shot noise in vacuum tubes and semiconductor junctions . . . noise from spontaneous emission of electromagnetic radiation . . . and noise in gas discharges. This practical book also explains auxiliary mathematical techniques, and discusses the relation of signal and noise in various types of communication systems. For ease in use, the simple tuned circuit associated with a device for measuring average power is made the basic tool for analyzing noise.

ELECTRICAL NOISE

270 pages, 6 x 9
105 illustrations
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By WILLIAM R. BENNETT

Data Communications Consultant, Bell Telephone Laboratories, Inc.

Each chapter in this helpful book begins in a simple, practical manner and works toward more complicated examples. For example, properties of thermal noise and its relation to blackbody radiation are deduced from basic laws of thermodynamics and statistical mechanics. You also will find a clear treatment of elementary quantum mechanics in discussions of the maser and of noise in semiconductors. And, in describing noise properties of various devices, the book fills in your working background with basic facts on junction diodes – transistors – gas discharge tubes—klystrons—traveling wave amplifiers—and others. Both independent and dependent noise sources are analyzed.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure. Throughout, the book stresses the universality of noise-like phenomena. Noise formulas for diodes and transistors; noise generation to meet specifications; design of amplifiers for minimum noise effects—these and many other topics are covered. A comprehensive review of noise in the various methods of signal transmission such as amplitude modulation . . . frequency modulation . . . and the different kinds of pulse modulation is included.

CONTENTS

1. General Properties of Noise
2. Thermal Noise
3. Distribution of Magnitudes in Noise Sources
4. Noise in Vacuum Tubes
5. Noise in Semiconductors
6. Noise in Electromagnetic Radiation
7. Noise-generating Equipment
8. Noise Measurements and Techniques
9. Design of Low-noise Equipment
10. Application of Fourier Analysis to Noise Problems
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Allen Smith Says He'll Never Voluntarily Retire From the Theatre Equipment Field

Some sage said "the modern majesty consists in work," and Allen G. Smith agrees with him.

Allen has served National Theatre Supply Co. for 36 years, so he's well above the company's retirement age, and he told us at a recent interview "that as long as I can get around, I'll be a theatre supply dealer or go to my first trade as a projectionist"—he's a card holder in Local 249, in Dallas.

Born in Austin, Texas, he started his career as a projectionist in 1910 at the Magnetic Theatre, Wapaneck, Oklahoma—the Magnetic's location was in Indian territory. Smith said "in those days we were crank turners, not operators."

Allen's career as a projectionist lasted three years. He then joined the Southern Theatre Equipment Co. in Dallas, owned by William Oldnow. Southern Theatre Equipment continued to expand and when it established an Oklahoma branch in 1923, Allen was named the manager.

Smith's 49 years as an associate with the theatre supply field has made him many friends from coast to coast with projectionists, officials of IATSE locals and theatre owners.

Among his distinctions, he served on the War Production Board in World War II, with a leave of absence from NTS, in Washington from 1942 to 1945. He was chief of the 35mm division and when the Limitation Order L325 was drawn up, which controlled the manufacturers and distributors of all 35mm equipment, he was administrator of that order.

After the war he returned to the NTS general office in New York as head of sales for major circuts.

When, in 1926, National Theatre Supply was formed the company absorbed the Southern Theatre Supply Co., so Allen Smith is a charter member of NTS. He formerly was manager of the Kansas City and Chicago branch of NTS.

In 1930, Smith was assigned to Fox West Coast Theatre, then allied with NTS, where he was supervisor of maintenance.

Allen came to New York in December 1947 as the manager of NTS branch in West 44th Street. He held that post to 1961. In the latter year NTS merged the New York international and motel and sales division to a single operation under vice president A. F. Baldwin, Smith had a new assignment, as a sales supervisor and technical installation and contact man for exhibitor conventions.



Allen Smith

Allen is concentrating on the sale and installation of the XL Transistor sound system, the XL Projector and the Ashcraft Core-Lite Lamp which NTS exclusively distributes.

The friendship of Smith and C. S. Ashcraft, inventor of the Core-Lite lamp, goes way back.

Like all sales executives, Allen is natty in appearance, with well tailored clothes. Though he's been everywhere in the country he hasn't lost his Southwest drawl, with which he speaks softly but firmly.

A veteran of the sound and projection field, Allen Smith has the personality of show business, so he's respected in the film industry for his knowledge about theatre equipment

Allen is an honorary member of the 25-30 Club, the Projectionist Square Club in addition to cards in IATSE locals. He is a Shriner and he's active in Masonic affairs, as they pertain to the theatrical world.

Allen G. Smith now lives in Red Bank, N. J., and commutes to New York. With all his experience about equiping theatres, he's an asset to his company, theatre owners and projectionists. **iP**

Ashcraft Core-Lite Projection Lamp Described in Technical Brochure

A new four page brochure describing in detail the Ashcraft Core-Lite motion picture projection lamp has just been issued by the C. S. Ashcraft Manufacturing Co.

The brochure shows an interior view of the Core-Lite for the first time, and illustrates the Core-Lite High Reactance 12 phase rectifier, designed for the requirements of the new lamp.

The brochure describes the Core-Lite as ". . . a 35mm projection lamp into which is incorporated an entirely new optical system with the projection lenses you are now using. A single, continuous cone of light from your mirror through the film and into your lens projects all the light from the carbon arc onto your screen with an absolute minimum of loss.

"Because the particular shape of the Core-Lite conical light beam eliminates the losses in your lenses due to vignetting, the light on the sides of the screen is increased to any degree desired for your particular theatre. It is now possible to obtain an evenly illuminated picture from side to side and corner to corner especially on the shorter focal length lenses."

The brochure explains how sharper focus is brought about, explains the absence of film embossing with resultant loss of focus and goes into detail about lower carbon consumption.

Explanation of the proper type of carbon for use in the Core-Lite, together with recommended and not recommended power sources, for proper efficiency in use of the new lamp, also are included in the brochure. **iP**

Chicago's New Theatre By Balaban & Katz

CHICAGO — The 850-seat Lyric, newest Chicago area theatre, opened Dec. 21 in suburban Blue Island. The Great States division of Balaban and Katz will operate the theatre which replaces the original Lyric destroyed by fire two years ago. The Lyric has a CinemaScope screen and was designed for patron comfort. To improve acoustics the one floor auditorium has no balcony. David B. Wallerstein, president of Balaban and Katz, presided at the opening along with the Blue Island mayor. **iP**

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A Scene From America's Projector Carbon Center...



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"We pay this inspector a premium to be sure you get only straight projector carbons"

says JIM NAUGHTON
National Carbon Sales Engineer



Jim Naughton

Just like the Western movies – National Carbon offers a reward for the capture of "bad guys." To make certain that only "good guy" carbons are shipped from our Fostoria, Ohio, plant, we pay our inspectors a premium to detect and discard any projector carbon that can't pass our rigid tests.

In the straightness test illustrated above, each "National" projector carbon is passed under an accurately-positioned gauge. No carbon gets by if it is out of alignment more than a few thousandths. Why are we so particular about *alignment?* For the simple reason that only straight carbons burn with correct cratering, resulting in the maximum light on your screen.

Quality manufacturing and precision testing are only a part of the "National" projector carbon story. For 45 years National Carbon has backed theatre owners with the industry's most dependable technical service.

Our Sales Engineers are equipped with today's most modern test devices... to assure you more light per carbon dollar.

Contact Mr. National Carbon



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